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## Improved Single-Needle Knitting Machine.

The Hinkley Family Knitting Machine is the result of a successful attempt to produce a Knitting Machine adapted to the formation of all plain or fancy knit fabrics for family use in a simple and expeditious manner, while free from the complications to which all other "Knitters," with needles numbering from 75 to 125, are subject, although they are generally capable of producing merely a straight circular tube, only susceptible of change by varying the tension of the loop or stopping the machine and taking out or inserting needles each time it is desired to widen or narrow a single stitch.

The desideratum of a simple, cheap, and yet substantial household machine, producing the handsomest and best work, is obtained by the use of a single eye-pointed needle, in connection with a simple looping mechanism and a work-supporting comb traversing longitudinally in front of the needle, wh'ch by suitable contrivances, is . . . rned in its motion either automatically or by the operator at option, according to the design of the intended fabric.

The driving wheel, A, Fig. 1, is supported by a standard on the base of the machine, adapted by its crank for hand power, and by passing a band over its grooved periphery to a balance wheel under the table, for a treadle, as in sewing machines. It drives the friction pulley, B, on the shaft, C, which engages in the groove of the driver.

This pulley is the subject of a special patent, and is composed of two parts or halves—one fast and the other loose—facing each other and holding between them a thin circular disk of steel, which by two equi-distant corrugations, springs them apart and is adjustable by set screws, thus giving a short connection without the usual wear on the journal, making no noise, and having a slip sufficient to save the working parts should any obstruction suddenly interfere when in rapid motion.

The disks, D and E, on shaft, C, engage through a right and left hand worm respectively on their inside faces, with the gear, F, and through its shaft and corresponding gear, G, communicate a traversing motion to the rack on the comb, H, of one tooth to each revolution of themselves, each of course reversing the former direction, as by the lever, I, the gear, F, is thrown from connection with one to the other worm.

This shifting lever, I, is either worked automatically at its anterior projection by the arrival of the indexes, J, on the comb—which are moved to any point on the comb at pleasure, governing the width of the fabric—or by shifting the lever by the finger of the operator, in each case, if desired, while the machine is at high speed. The change of position of the lever, I, cant the dog, K, centered in a slot on a swinging bearing, which dog, then striking a small projection on the inner face of D or E, between the worm and the journal, throws the gear, F, into connection with the opposite worm at once, reversing the direction of the rack.

The necessary reciprocating movement of the needle carrier, which holds the needle and its tension, is obtained from the crank pin on the disk, E, by a connecting bar, M, which also operates the looping mechanism, supported on the bracket, L, through the medium of the slotted arm, N, and the oscillating quadrant, O, (see Figs. 2 and 3), in exact conjunction with the advance of the needle, P, and replaces a new loop on such successive tooth of the traversing comb as the needle removes its predecessor.

The numbers to which the indexes, J, Fig. 1, point show at once the width of the fabric, while they remain in that position, and the counter, Q, is pushed forward one notch by

each change of the lever, R, giving, at a glance, the number of stitches in length that the work has progressed, thus automatically saving the old drudgery of counting each stitch, as is still necessary in hand work, or by other knitting machines, and reducing the labor of knitting a stocking or any other fabrication, to a simple rule of changing the indexes at such times as the counter has enumerated a certain number of loops or stitches in length.

The bobbin, S, is attached or detached from the base by means of a short screw, projecting from its bottom, which screw also fits in a screw shank in the center of disk, E, and

ing it on the tooth in readiness, it "sets up" its own work and will not require the loops to be "cast on" previously by hand, that the stitch must be the same as that taken by hand from one needle to the other, and that each edge will be a selvedge edge like cloth, and the top of the work—as for instance, a stocking—will be "finished" as it comes from the machine.

From the simple arrangement of parts, it is also evident that both the work and the machinery are in full view of the operator, and easily understood by any one; the machine can be run by the hand or the foot, like a sewing machine; that any size yarn or cord can be used

that will pass between the teeth of the comb, which are constructed to admit of all grades; that by its gearing an extreme high speed can be reached, which, with the quickness of widening and narrowing, gives it the preference over the hitherto "fast" knitters; that any desired shape can be produced, regular or irregular; that the tension can be altered in a second; that by reason of its friction gear and worm arrangement it is almost noiseless. It also knits the button-holes in a garment, knits in different yarns without tying them together; knits any fabric from an Afghan to a pair of gloves; knits a stocking complete with a hand heel, knits double if desirable, and requires only a seam up the back to produce hosiery equal to hand-knit, and superior to those formed of a tube with only a small "bulge" on them for heels, and which, after washing, are liable to return to an almost uniform tube.

This machine is patented in this country, Great Britain, France, Belgium, New Brunswick, etc., and received a medal for simplicity at the Paris Exposition. It is manufactured by the Hinkley Knitting Machine Co., at Bath, Me., and all orders and applications for agencies, etc., should be addressed to Edward Sewall, the Sup't and Treas.

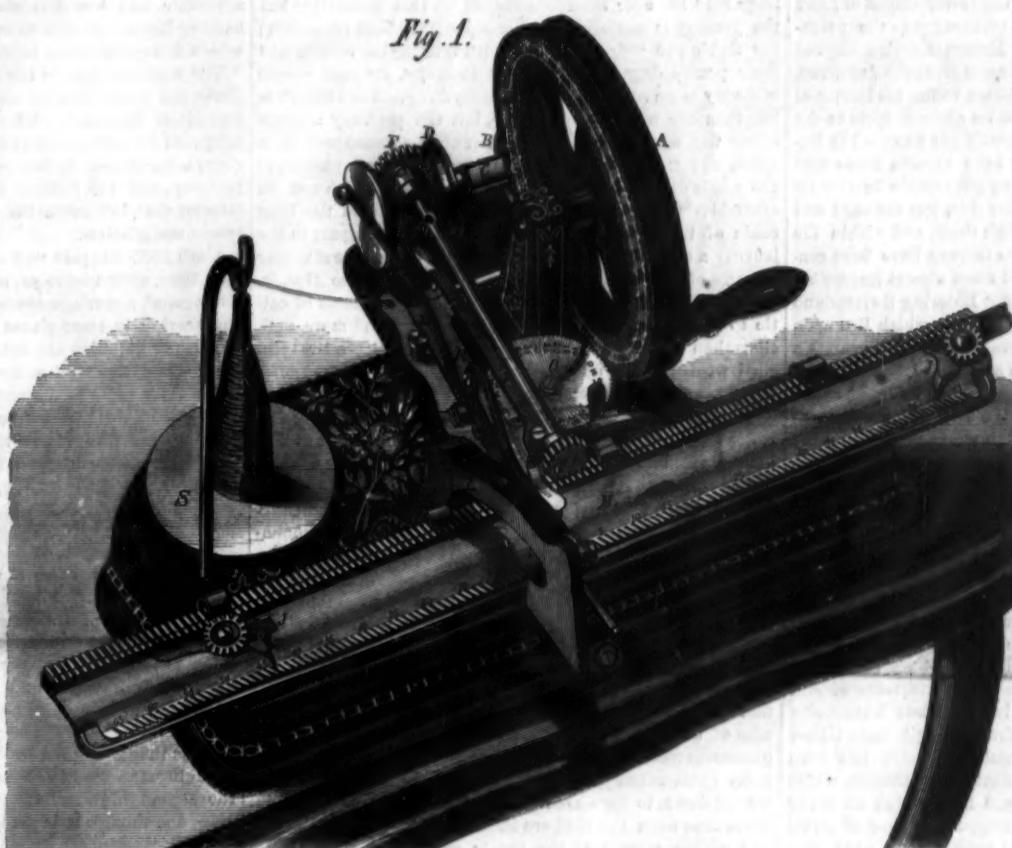
at that place. G. E. Harding, the General Agent for New York, will also furnish information and machines at his office, 726 Broadway, New York city.

## Period of the Growth of Man.

Prof. B. A. Gould, from statistics derived from the register of two and a half millions of men in the U. S. Army, has brought out the fact that men attain their maximum stature much later than is generally supposed. This takes place commonly at 29 or 30 years of age; but there are frequent instances of growth until 35, not very noticeable,—a yearly gain of a tenth of an inch perhaps, still a growth. After 35 the stature subsides in similar proportions, partly perhaps from the condensation of the cartilages, partly because of the change in the angle of the hip bone. The age

for maximum stature comes earliest to the tallest men, as if it were the necessity of unusual development. Foreigners were shorter than men of native birth. The heights of men seemed to depend on the place of enlistment. A Massachusetts man enlisting in Iowa was an inch taller than if he had staid at home. As we go West, men grow taller. One man measured more than 8 feet 10 inches. Out of one million, there were five hundred thousand who measured more than 6 feet 4 inches; but men of such stature do not wear well. In Maine, men reached their greatest height at 27, in New Hampshire at 35, in Massachusetts at 29, in New Jersey at 31. The tallest men, of 69 inches, come from Iowa. Maine, Vermont, Ohio, Indiana, Minnesota, and Missouri, give us men a little over 68; and the average of all shows the Americans to be "a very tall people."

THE WEIGHT of a million of dollars in gold (currency) is 53,750 Troy ounces, or 4,479 lbs. 2 oz., equal to 2  $\frac{1}{2}$  tons.



THE HINKLEY PATENT KNITTING MACHINE.



Fig. 2



Fig. 3

The work hangs from the teeth of the comb in front of the machine, in the plain view of the operator, and, unlike all other knitting machines, this uses no weights to drag down the work from the needles, thus requiring a different weight for each variety of work; here a small rod, seen under the comb, obviates their necessity. In Figs. 2 and 3, T represents the tension screw, which will regulate the yarn to be knit, close or loose. In one the looper and needle are in contact, as when the stitch is to be removed, and the other shows them receded from one another.

It will also be apparent, that by the use of a traversing comb, of any length, either straight, curved, or circular, that one needle performs the work previously requiring as many needles as the comb has teeth, that the "widening" and "narrowing" is adjusted, stitch by stitch, or as many as is desirable, in an instant, by sliding the indexes along the comb. By the arrangement of the "looper," taking the loop from the under side of the needle at each advance, and plac-

## EDITORIAL CORRESPONDENCE.

*From Germany to Italy over the St. Gothard—Swiss Towns, Mountains, Lakes, Glaciers, and Rivers*

ARONA, Lake Maggiore, Sept. 10, 1867.

I suppose that no other country in Europe is so well known to tourists as Switzerland. Easy of access from Great Britain and all parts of the Continent, it is not surprising that so many travelers rush to this most wonderful region. It is roughly estimated that fifty thousand English people visit Switzerland during the months of July, August, and September, and I should judge that about one half of the whole number of visitors this season were Americans, some of whom are wonderfully expert at climbing Alpine heights, and in itinerating on foot over long fatiguing passes. The only ascents of Mont Blanc which have been made this season were performed by two gentlemen from New York. With the exception of some of the smaller mountains, the ascents of which are comparatively easy, I have contented myself with a view of the immense snow-capped summits from beneath, rather than undergo the peril and fatigue of undertaking to climb to their tops. Switzerland is literally a land of mountains, lakes, cascades, glaciers, and rivers, the charms and grandeur of which have inspired the pens of poets, philosophers, and sages, who seem never to weary of their ceaseless beauty and variety. Gibbon found a spot upon the lovely shores of Lake Leman where he devoted himself in tranquility to the preparation of his great history of the Roman Empire. Byron watched the falling of avalanches of snow from the Jungfrau, and visited the gloomy prison of Chillon to fire his immortal genius, and Rousseau selected one of its choicest spots as the scene of his Heloise, which sentimentally has no equal in European literature. Nature seems to have thrown these vast mountain chains together to form an impassable barrier between the countries that lie on either side, but the skill and ingenuity of man has broken through them, and within the last few years the high road and the railway have been constructed to penetrate where it would seem almost impossible for man or beast to thread their way. Entering Switzerland from the rich and populous old city of Bale, which lies upon the Rhine, the railway for a considerable distance traverses a flat country, and then commences to ascend the mountains by a gradient of 1 in 20; the Mont Cenis pass is 1 in 12. Several valleys are crossed on bridges, and the line constantly rises, until in some cases the trains run high above the picturesque little villages down in the valleys below. The Unter Hauenstein, which is two thousand feet high, is pierced by a tunnel over eight thousand feet in length, and serves as an outlet for the chief traffic between western Germany and Italy over the great pass of the St. Gothard. From the heights at this point the first view is had of the immense snow peaks of the Bernese Alps, and the traveler is conscious of having entered a land which combined more of grandeur and sublimity than any other spot of equal size upon the globe.

The next most important city is Zurich, which, aside from its agreeable situation and extensive manufactures of silk and cotton, possesses very little interest, but historically it is remarkable as the place where Zwingli and Ulrich began the reformation in Switzerland. Zurich has been sadly afflicted this summer by a visitation of cholera, which in spite of every sanitary precaution has carried off many of its inhabitants and effectually stopped the flow of travel in that direction. And here I feel constrained to say that amidst all these wonderful charms of nature which abound in Switzerland, there are also added some repulsive features which cannot escape the notice of travelers. In spite of the abundance of water which invites every inhabitant to observe the strictest degree of cleanliness, I should say as a general thing that the rural populations were quite as filthy as those of any other country I have visited. The *châlets* are constructed to shelter under the same roof men, women, children, cows, goats, pigs, and poultry, and the practice is very common, even among farmers near the larger villages, to form the compost of stable manure and household refuse in the front door yard, the odors of which, it seems to me, ought to arrest the attention of the sanitary authorities. I do not wonder that the cholera has this year visited some of the Swiss towns—the wonder is that it has not prevailed to a more fearful extent. If extremes in nature abound in Switzerland, so also extremes meet in the social life, for among the more improved classes there is not only an aristocratic pride but a wonderful degree of good order and cleanliness; therefore as a general rule there is very much more to admire than to condemn.

Of the many points of attraction in Switzerland, no spot possesses more interesting features than Lucerne. The town itself is old and picturesque and by no means particularly nice, but the lake and surrounding mountain scenery, together with the historic associations connected with the name of William Tell, all combine to render this place one of the most sought after in all the Swiss Cantons. The land side of the town is still protected by an ancient wall surrounded by watch towers erected five hundred years ago, and there are some quaint old bridges across the Reuss, one of which has a curious fresco of the dance of death, which represents how the grim monster indiscriminately took his victims of every age, rank, and station, during the visitation of the plague in 1409.

A carriage drive of an hour and a half leads to the rude old chapel which was erected on the spot where Tell shot the tyrannical Gessler. The drive to this chapel along the borders of Lake Lucerne is grand and lovely in the extreme. The roadway is skirted by cheerful Swiss cottages, usually of the first class, beautiful fields well covered with fine fruit and park trees, and in sight of the Rigi and some of the peaks of

the snowy Alps, which lift their white caps far above this most beautiful lake.

The most interesting object in Lucerne is the monument to the Swiss guards who fell while defending the royal family of France, Louis, XVI., Marie Antoinette and their children, when the infuriated mob attacked the Palace of the Tuilleries during the first French revolution of 1792. The design is by Torvaldsen, and represents a lion of colossal size mortally wounded, with a broken spear in his side, endeavoring to hold in his paws the shield of the Bourbon family. The figure, 28 feet long and 18 feet high, is chiseled in the perpendicular face of a sandstone rock overhung by creeping vines and shrubs, and there is a small pond of water at the base of the rock supplied by a little streamlet that flows down the cliff, which forms a sort of mirror to reflect the image of the dying lion. The design of this monument is certainly unique, and when it is considered that these brave Swiss were hired soldiers and fell fighting for the royal family when assailed by their own subjects, it becomes most touching and impressive.

The ascent of the Rigi is made from the pleasant little village of Weggis, which is reached from Lucerne by steamer in about half an hour. It is very fashionable to ascend the Rigi; therefore almost everybody undertakes it, and I must confess that the toil and fatigue are amply repaid by the wonderful panorama that breaks upon the vision. No carriage road has ever been constructed up this mountain, but the journey is performed either upon horseback or on foot; the feeble and infirm, together with fat English women and their poodle dogs, are carried up in chairs, for such people will very often persist in seeing everything. The summit is less than one mile above the lake, but the pathway zigzags along the western slope of the mountain a distance of nine miles, and traverses gardens, fruit orchards, and pasture the whole distance. The view of the lake beneath and its emerald waters, which always remain visible, and the long chain of the Oberland Alps that lie beyond, impart to the journey a constant and thrilling interest. One of the singular features of the Rigi, peculiar also to many of these Alps, is, that it affords pasture for flocks of sheep and herds of cattle to its very summit. Nothing is sweeter and more delicious than these mountain grasses, which constitute the principal wealth of the neighboring inhabitants. As the snows disappear the flocks and herds gradually ascend the mountain, following the productions of spring, which rise to life under their feet from day to day, until the snows of autumn compel them to retire to the valleys below. There are upward of four thousand cattle, chiefly cows, and numerous flocks of sheep that feed upon the Rigi, and the herdsmen reside in rough little *châlets* all along up the sides of the mountain. About one third of the distance up a small chapel has been erected for the use of the herdsmen. Apart from the spiritual benefits which this place affords to the humble worshippers, there is also attached to it a shed where excellent beer is supplied to refresh the weary body. This combination of chapel and beer-shed is not exactly according to the rigid institutes of Calvin—who I believe was a Swiss—but I notice that the pilgrims of Mont Rigi are usually very glad to partake of the refreshment thus offered. Vast masses of conglomerate rock lay scattered all along the wayside, and during some extraordinary upheaval immense boulders have been hurled down, to form archways over the path. Hotel accommodations upon the Rigi are abundant. The best, the Kaltbad, within a mile of the top, is much frequented for its magnificent views and bracing mountain air, and many visitors spend weeks at this comfortable resting place. A smaller hotel stands a little nearer the top, and the Rigi Kulm, a house capable of lodging two hundred people, is perched upon the very pinnacle, and is always crowded during the season, chiefly by those who wish to spend a single night.

I noticed upon the register of this hotel that names were registered as early as March 22d and as late as December 26th. In some places the narrow bridle path runs along the edge of fearful precipices, and a single misstep would throw the traveler hundreds of feet into the dark abyss beneath.

The day of our ascent was cloudless, and we reached the summit in good time to behold a most brilliant sunset, and at eight o'clock the full moon came beaming over the snowy peaks, which, reflecting upon the surrounding lakes, and combined with the myriad of lights thrown out from the numerous villages and *châlets* produced a most wonderful effect, much finer to my mind than that produced by either the rising or setting sun. At half-past three in the morning the sleepers were aroused by the Alpine horn, and in a few minutes the house was hurriedly emptied of its occupants, men, women, and children rushing out to gain the highest peak, some with bed blankets thrown over their shoulders, some in morning gowns and slippers, all anxious to witness the rising of the sun, which is considered one of the chief features of this mountain view; and indeed the sight is well worth all the trouble it cost to obtain it, but frequently, owing to the fog that gathers about the summit, thousands go away disappointed. I met one old gentleman who had doggedly persevered ten days in endeavoring to see the sun rise, and finally had his perseverance rewarded. The panorama of the Rigi sweeps over a circumference of three hundred miles, and embraces a combination which in extent and variety is scarcely equaled by any other in Switzerland. The labor of supplying the wants of so many visitors is prodigious. The supplies are carried up chiefly upon the backs of mules, but trunks, valises, and other articles are carried upon the backs of men and women. It is not unusual to see one of these men with his wooden rack strapped upon his back, lugging one of those immense trunks which are nearly as large as the *châlet* that covers his head, and scores of lads are eagerly watching to carry the pedestrians' effects up or down, and it

is surprising how much they will undertake to perform. These people will sometimes make two of these trips in a day. The descent of the Rigi is most usually made on foot, as the exercise of riding down is not considered the most agreeable, and although not much of a pedestrian, by the assistance of an Alpenstock and an occasional draft of fresh milk, which is readily obtained at the wayside, I made the walk without much fatigue in three hours.

Lake Lucerne, or more properly the Lake of the Forest Cantons of Uri, Unterwalden, Schwyz, and Lucerne, which surround its shores, is unquestionably grander and more sublime than any other lake in Europe. It is completely walled in by stupendous mountains, with here and there a picture-like village, which seems to stand upon the accumulated debris which for ages has been washed down from the heights above. At one time, before roads were cut along the lake, one of these little villages boasted of being the smallest independent state in Europe, as its inhabitants, sheltered from assault, refused to recognize any other earthly government except their own.

At the upper end of the lake is the poor little village of Fluelen, where begins the carriage road over the St. Gothard into northern Italy. Diligences leave daily for Bellinzona, 76 miles, but travelers who wish to enjoy the scenery of this great pass to advantage, must either take a carriage or perform the journey on foot. Preferring the former as the more agreeable and less fatiguing, we engaged an outlandish-looking Italian *catturini* to transport us over to Lake Lugano, which is twenty miles beyond Bellinzona.

The roadway follows the tortuous windings of the river Reuss the whole distance clear up to Lake Lucendo, near the summit of the pass. Its waters rush through the wild gorges of the mountains at a fearful velocity, the effect being always heightened by the immense rocks that stand in its pathway, and the volume is augmented by the numerous streams that flow down the mountain sides from the melting snows and glaciers.

Until 1832 this pass was only made over a bridle path. At that time, after twelve years of labor, the neighboring Cantons opened a carriage road—one of the finest in Europe. The engineering in some places is of the boldest character. Side terraces or galleries are cut along the face of the granite heights, sometimes at a distance of nearly a thousand feet above the river. In the narrower gorges it was necessary to let the workmen down from the top of the mountains by means of ropes, to enable them to drill and blast into the face of the rocks to get a foothold to work a tunnel underneath. And thus ascending, we reach at length

"The Gothard's heights, where everlasting lakes,  
Pill'd from Heaven's founts, supply the streams below—  
Another river, issuing thence, will guide  
Thee into Italy, thy land of promise."

At the summit there are two common hotels, some peasant beds, five St. Bernard dogs, and several little lakes of clear water, from one of which rises the river Ticino, which accompanies the tourist on his journey to Italy, down through the awful Val Tremolo, so deep that snow lays in midsummer upon its dark edges, and the roadway descends from this fearful height by abrupt zigzags, which coil along the steep like the folds of a huge serpent basking in sunlight.

I was thankful when we had rounded the last curve that brought us to the little village of Ariolo, where we rested for the second night. Here everything has an Italian appearance, and though it is many miles from Italy, the language and the customs are Italian. Owing to the existence of cholera in Italy, we were compelled to obtain a certificate from the Syndic at Faido that we had come from the mountains, but this did not save us from suspicion; therefore, upon arriving at Lugano, at ten o'clock at night, our carriage was stopped and we were invited to walk into a small room and undergo the agreeable process of fumigation; and upon leaving Lugano the next day for Lake Maggiore, and before crossing the frontier into Lombardy, we were again entertained at "Hôtel Funiger." People coming up from Italy were required to quarantine for a few days before being allowed to proceed.

Many years ago I remember to have read a graphic description of the sensation of gloom experienced by the writer, of midnight in a ruined city and upon the lonely desert, but it seems to me that almost anything would be preferable to the awful dullness of this region. Hotels, streets, carriages, steamers all deserted, and a general melancholy hangs about everything. Such is the effect upon a people oppressed by the fear of cholera. The skies, however, are bright, and the vine, mulberry, and the fig grow luxuriantly. S. H. W.

## Gatling's Gun in Europe.

A French journal announces that the Ordnance Department of France is quietly supplying Gatling's Gun to the artillery corps. The Press of Vienna says: The artillery committee, in presence of the Archdukes William and Regnier, as well as the Minister of War and a large number of officers, has just made some experiments with a new firearm, which has been called the *mitrailleuse*, invented by MM. Montigny and Christopher of Brussels. This weapon is composed of 31 steel barrels placed in a common tube. The apparatus opens behind and receives 31 cartridges which, by means of a piece of mechanism, enter the barrels. The 31 shots are fired successively, and the whole operation only takes 30 or 40 seconds. The experiments were not successful; many of the shots missed fire, and very few went straight. The *mitrailleuse* appears very inferior to the cannon on the Gatling system (American). The latter fires 100 to 120 shots a minute, and the former only 60 to 70. Messrs. Gatling, moreover, have much improved their cannon, and before long are going to submit to the Austrian Government a ten-barrelled revolver cannon which will fire 300 shots a minute.

**A NEW THEORY OF CHEMISTRY—THE GALVANIC BATTERY DISSECTED, AND SPECULATIONS CONCERNING OZONE.**

At the meeting of the New York Lyceum of Natural History on Monday, 14th inst., a paper was read by Prof. Charles A. Seely, of this city, on "Chemical Dynamics." We present below the principal features of the communication in a condensed form.

In recent treatises on chemical physics may be found tables of the calorific equivalents of various elements. These tables show the amount of heat evolved in the union of various pairs of elements. This heat is commonly known as the heat of combustion. One gramme of hydrogen (H), burning in chlorine (Cl), evolves 23,783 units of heat. This amount of heat involves, indicates, or represents a certain definite amount of force which was used in its production. This force has been designated chemical affinity, and is often supposed to be a species of attraction. The heat of combustion is a measure of chemical affinity.

The heat of combustion has been supposed to be the result of a collision or clash of atoms; the atoms are brought together by an attractive force, and on the collision, the movement takes the form of heat. Is affinity an attractive force, and does it obey the laws of gravity, and other forces of attraction? Is affinity proportioned to mass, and does it vary inversely as the square of the distance? Attraction implies condensation, a phenomenon which does not necessarily take place in chemical unions, and if affinity were like gravity, the force being proportioned to the mass, the ordinary numbers of the chemical equivalents would express its distribution among the elementary atoms. Can the force which the heat of combustion represents be divided among the atoms, and if so, what is the portion of each? Of the 23,783 units of heat involved in the combustion of H in Cl, how much was due to the H, and how much to the Cl? What is the potency equivalent of H, and what of Cl?

It has been found by experiment that if three metals, A, B, and C, be so related that A is capable of displacing B and C from their combinations, and B is also capable of displacing C, the heat developed by a substitution of A for C will be exactly equal to that developed in the substitution of A for B, together with that developed in the substitution of B for C. From this and other similar facts, the author infers that each free atom is endowed with a definite and constant potency, which exists in it as a latent force, and which assumes the form of kinetic or effective energy only in the act of combination, when it appears, and is measurable as heat. The author has constructed a table of atomic potencies by the following process: Let A, B, and C, be three elements, and let their respective potencies be represented by x, y, and z, expressed in terms of heat units. Then from experimental data we have  $x+y=m$ ,  $x+z=n$ ,  $y+z=o$ , from which the values of x, y, and z, are easily determined. The numbers, however, thus obtained, as true representatives of the dynamical value of atoms, are not altogether satisfactory or consistent with each other. The available experimental data are, at the present time, insufficient in amount and accuracy for a determination of numbers with that exactness which is demanded by scientific men. But a study of the table in its imperfect form suggests entirely new paths of research, and will assist in the comprehension of facts already known.

As an example of the application of this dynamical theory, the following illustration will suffice: In the union of H and Cl, the potency or energy of the atoms appears and escapes in the form of heat. After the union, they remain together by virtue of a sort of atomic inertia. To decompose the HCl (hydrochloric acid), the lost potency must be restored; the decomposition involves the same amount of force as the original act of union. If zinc (Zn) be added to HCl, and takes the place of H, then Zn must give up its potency, and H must resume as much as it lost in the original union. The H is eager for that which the Zn seeks to give; the force passes directly from the Zn to the H, and the Cl is throughout impulsive. It happens that Zn has an excess of potency above the H, and this excess escapes with the H in the form of heat. This view of the case is well confirmed by experiment.

Again: suppose a plate of Zn and of platinum (Pt) be immersed in hydrochloric acid, a condition of things which may be represented thus: Pt, H Cl, H Cl, H Cl, Zn, and which, moreover, is a type of a voltaic circle. The Zn being pure or amalgamated, does not combine with the contiguous Cl. But yet there exists an affinity between them. Also, there is an affinity between the Pt and the contiguous H. There is a pull on all the Cl toward the Zn, and of the H toward the Pt. Moreover, the H at the right is held in a sort of suspension between the atoms of Cl on each side of it. The word polarization well expresses this peculiar relation of the atoms. The Zn is on the point of giving up its potency, and the H contiguous to the Pt is ready to receive it, but there is no path between the two which the potency can take. Now, in this condition of affairs, let the Zn be connected with the Pt by means of a metallic wire, and the potency of the Zn passes over to the Pt, and through the latter to the contiguous H, which now assumes its elementary form. The Zn being freed from its potency, unites with its neighbor, Cl. The passage of the potency along the wire is what we call electricity. The excess of what the H needs to exist as an element, takes the form of heat and escapes, and it is this excess which measures the amount of useful work which can be obtained from a battery in practical operations.

If this electrical theory be true, it appears that there is but one kind of electricity, and that in the battery it moves only through the wire, and not through the liquid. It will be observed it is from the Zn to the Pt, while the old theories make the course of the so-called positive current in precisely the opposite direction.

The author here gave an interesting speculation concerning ozone. It has recently been determined that ozone is an allotrope of oxygen, differing essentially in the fact that it has a greater specific gravity. Oxygen, in separating from a compound, rises to its ordinary form by two lifts or stages. First as ozone, then as oxygen, the latter containing and requiring an addition of potency. The battery, therefore, which is economical of its force, sets free the oxygen in the decomposition cell only as ozone, and thus it escapes; the potency which is required to raise the ozone to the form of oxygen must come from other sources. When oxygen is set free from combination at a temperature below 300°, it probably always takes the form of ozone. Also, it is likely that the hydrogen escapes in a condensed form on the surface of the platinum, and provided as much of the energy of the battery is taken away for outside work as possible, the hydrogen takes up heat from the platinum and the solution which it needs to exist at the ordinary tension and temperature.

If this theory should prevail after it has been submitted to the scrutiny of the scientific public, it will bring about a radical change in our notions of chemical phenomena. It reduces chemistry to a branch of mathematical philosophy, and makes properties and changes of properties of matter, only cases of positions and motions of atoms.

### Correspondence.

*The Editors are not responsible for the opinions expressed by their correspondents.*

#### Cipher Writing—A Universal System.

MESSRS. EDITORS:—So much has recently been said in the columns of different newspapers throughout the country on the subject of "Cipher Writing" and "Deciphering," I have made bold to request a limited space in your valuable sheet for the purpose of ventilating a few ideas of my own on this much discussed question. The late comments on this subject have arisen partly from a story recently published in *Blackwood*, in which cipher writing is indulged in by one of the characters, and the art of deciphering by another. The story itself is not pertinent to the question, other than the remarks of the hero in explaining his theory of the art of deciphering any written words in cipher, and he is not the only one who has asserted that any written cipher can be deciphered, and this belief has spread itself through hundreds of newspapers influencing their thousands of readers. As a late editorial justly remarks, "If the whole system of cipher writing can be unlocked by other means than the key, its extension and use as practiced at the present moment by thousands of business men and others in the transmission of valuable telegraphic dispatches regarding stocks, gold market, merchandise, police matters, and the secret business of the general government, is of but little account, and anything but a safe medium to transact business requiring absolute secrecy, from all but the person or persons intended, and may account for some strange developments in civil as well as military life." Now, all this may be true as applicable to any ordinary system of cipher; and the writer in *Blackwood* is undoubtedly correct in his explanations of how to decipher any cipher writing in common use; but I must beg him to make one exception in favor of a system of "ciphers" of my own invention, that I am confident will baffle the keenest wit that ever lived to decipher without the key. It is the simplest of all ciphers, because it requires no written key to understand. The key is carried in a person's mind, and can't be forgotten, because of its perfect simplicity; or it may be varied at pleasure, and the key be found anywhere in the Christian world, but useful only to those for whom the cipher may be designed. Another feature about this system is, that no matter how extensively its principles might be understood, any two or more persons could intelligently understand each other either by letter or telegraph, without the least danger that others in possession of its secret workings could be any the wiser had they years to study an intercepted sentence, unless it was so designed by the person sending the sentence, for the reason that it is susceptible of an infinite number of curious variations. I will now, with your permission, give a short sentence in this queer cipher, with the English of it underneath, and following which I will give a second sentence in the same cipher, and invite the most astute wit to decipher the second line, although with an example before him, each cipher rendered into English, and containing almost every letter of the alphabet—at the same time assuring all that the second line is as simple and easy of rendition as the first; and, though it may not seem so, yet is deciphered by the same key as the first line, when in the hands of one who not only understands its principles, but for whom the sentence is designed:—

*Cipher*—2 3, a, 4 9 6 4 1 2, B, 27 15, C2, B, 2, a12 13 14 15, Cl 6 3 7 4, D11, G2 10 3, I30 6 26 4 25 10 26 31, H1 2, I1 30 31 3, K5, I, 30 10 11, K5 7, M5, K1 3 4, I20 10 30, 6 7 a38.

*English of above*—“Washington came first—just, virtuous, brave, devoted, kind, loving.”  
*Sentence to be deciphered*—2 4 a1 2 25 23 5 27 13 13 17 16 7 7 9 38, E, 34 30, F9.

A glance at the above lines will show that the ciphers in the first line, with their English letters to correspond, do not make sense when applied to the second line, and herein is the mystery. On counting, the reader will find three more figures in the first line of ciphers than there are English letters in the explained sentence; and I will so far explain as to state, that the ciphers, 2 3, a, do not belong to the sentence, properly speaking, but are explanatory of the key—the first proper cipher letter is the figure 44, which stands for W.

Now, let some of the readers of the SCIENTIFIC try their skill at the last sentence, and give a satisfactory elucidation

of it, and the proper key if they can, and, when all have failed (as assuredly they will), I will, with your kind permission, in another issue, make the whole matter as plain as daylight, and furnish a cipher that will baffle detection.

Troy, N. Y.

C.

#### How to Manage Kerosene Lamps.

MESSRS. EDITORS:—I herewith communicate my "say" on the "Kerosene Lamp Question," which is founded on experience and actual experiment.

If the brass-work, cone, etc., is heated unusually hot, it will cause gas to generate in the lamp, which, as it produces pressure, will force itself up through and around the wick and ignite, causing the lamp to sputter, and even snap itself out. Now if, when it is "sputtering" the brass-work is cooled off, for instance, by wrapping a wet cloth around it, the lamp will cease sputtering and snapping and burn as it should.

An examination, while operating as above, will generally reveal charred and saturated wick burning around the base of the wick tube, or the flame of the lamp may impinge on the cone, owing to its being slightly turned or the wick having a ragged corner, causing the brass to heat and generating gas. Low proof oil, forming gas at a low temperature, is consequently more unsafe to use. If the wick fits the tube properly, blowing down the chimney is the best way to extinguish it, for the following reasons:—It is perfectly safe, the wick need not be trimmed for several days, thus obviating the necessity of regulating it every time it is lighted. A slight puff or a gentle flirt of the fingers across the top of the chimney, in an upward, slanting direction is all that is necessary. A tremendous and badly aimed blast is generally used, where a mere puff would suffice, if properly directed.

If the wick fits the tube, it is impossible to drive the flame down into the lamp by blowing into the chimney.

EXPERIMENTER.

Port Henry, N. Y.

#### A Proposed Flying Machine.

MESSRS. EDITORS:—I have heard whisperings of flying machines and other novelties of late—whether proceeding from Mr. Glaisher's new society, "*in nubibus*," I cannot say—but if anything of this kind is to be accomplished, my impression is we shall hear of it first from our side of the water; and, if you will permit me, I will give a brief outline of an idea that has occupied my mind, and which may be worthy the attention of parties interested, on taking to themselves wings. It seems hopeful to me, that, as we can support our bodies in the water, by two inflated bladders fixed across the chest, and over the shoulders, leaving our arms free for all necessary movements, so we might, in like manner, suspend ourselves in the air by the aid of a small elongated balloon filled with hydrogen gas, attached by a light frame of cane or wicker work fitting to the figure, and secured by strappings of stout linen, leaving the arms at perfect liberty to work the wings or other contrivances for progression and guidance—the wings made of strong fine silk, smoothly stretched over whalebone frames, capable of extension and retraction at pleasure. But in order to facilitate the operations of the wings, certain mechanical movements will be useful; and these I would propose to inclose in a kind of cuirass of the lightest of metals (aluminum), closely fitting to the chest, and which the arms and hands can completely command. The hydrogen gas is easily obtained from refuse iron and sulphuric acid, which can afterward be converted into a green vitriol. Experiments at trifling cost can be made to ascertain the volume of gas and size of balloon required to poised the body safely and easily in the air; and I am very sanguine that the success of progression and steering will eventually be perfected by some one of your clever correspondents.

I dare not trespass further, either on your patience or your waste basket, as that may be. Fluttering about over the chimney pots, on gaily gilded wings flashing in the sun, will be a pretty sight; but mounting over high precipitous rocks, or rivers, would save our thows and sinows, and, may be, our lives; and one apparatus would be of easy conveyance and of small compass.

For reconnoitering and prospecting purposes I think this plan might answer well.

THOMAS INGLE.

The Velletra, Ensworth, Hants, Eng.

#### A Correction.

MESSRS. EDITORS.—I perceive that owing to a mistake in copying, a serious error occurred in the article, "Volumetric Estimation of Barium page 244 of issue of Oct. 19, the sentence reading: "If a crimson coloration is produced add liquid from the burette until only a slight crimson tint is produced;" should have read: If no coloration is produced, cautiously add liquid from the burette until a crimson tint is perceived on testing with nitrate of silver in the manner described. Please insert this in your next issue and, oblige,

GEO. H. MANN.

Troy, N. Y.

#### That Big Saw Again.

MESSRS. EDITORS:—I notice a communication in Vol. 17, No. 18, of the SCIENTIFIC AMERICAN, dated Sept. 18, 1867, under the signature of Lamar Rose. Your correspondent attributes to me a statement which he cannot show in any written or printed paper from me viz.: "that a 15 horse power will drive a 52-inch saw of my make as hard as it can be driven." I have never made any such statement.

Forty horse-power can be expended in running a 52-inch saw of my make and the saw can be made to cut 40,000 feet of inch lumber in ten hours with that power. Furthermore, I am prepared to demonstrate by actual trial that with a twenty horse-power will applied and a saw of my manufac-

ture well kept in order, I can saw 25,000 feet of inch lumber in ten hours from good clean pine, poplar, or hemlock. In the hard, gnarly native timber of Connecticut, or in the muddy, gritty timber so often floated there a saw cannot be expected to work to one half its capacity.

What some men call 15 horse-power will not rate 10 horse-power taking into consideration the way it is used; i. e.: the horse-power as estimated by Watt, 33,000 lbs. raised one foot per minute. I have seen steam engines and boilers rated at 40 horse-power that were so miserably set up and worked that 10 horse power could not be obtained. The quality of fuel generally used in saw mills will not generate the greatest amount of steam, and consequently greater heating surface is required in the boilers or there is a deficiency of steam. Among the various kinds of water wheels in use, many are greatly over-rated in power. Judging from my own experience not one power in fifty, either steam or water, is ever tested; it is nearly all guess-work.

At Sandy Lake, in Mercer county, Pa., is a mill which I erected and in which I put the first of my saws ever run this side of the Rocky Mountains. The size of boiler is 12 feet long, 3 feet in diameter, two 12-inch flues; the engine, 7-inch cylinder, 10-inch stroke. I never carried over 90 lbs. of steam. No one would rate that engine over ten horse-power. The mill has an upper and lower saw 56 and 42 inches in diameter, and sawed the first year over 2,000,000 feet of lumber running only 10 hours in the 24, and has sawed more than 1,000 feet per hour of inch boards.

I am prepared to prove to your correspondent my assertion, viz.: a mill will cut 1,000 feet of inch lumber to the horse-power in ten hours. I assert that a 15 horse-power properly worked with a 52, 54, 56, or even a 60-inch saw will drive the saw to do a good business. Much, of course, depends on the quality and condition of the timber.

J. E. EMERSON.

#### Lifting Pumps and their Pipes.

MESSRS. EDITORS.—On page 211 current volume, Mr. Wm. Edwards says your answer to A. T. of Kansas was erroneous; assuring your Kansas correspondent at the same time that "a pump in such a situation would suck water considerably more than 23 feet." With proper qualifications the assertion is true, but under ordinary circumstances it will not work.

I have made pumps, and experimented frequently with reference to the proper length for suction pipes; my conclusions are that unless the channel or bore is enlarged as their length is increased they will not work when 31 feet long, which would be the length of A. T.'s suction unless he continued his eight feet depth dug at the mill to the river bank. Add to his 31 feet height 100 feet length and he would have 131 feet suction pipe. Dig a channel from the mill to the river and his suction pipe would then be 133 feet long; under ordinary circumstances neither lengths would work. Suction pipes of pumps are usually made with a 2 inch bore. In a length of 133 feet the friction against the sides in consequence of the rapid flow of the water through the long narrow channel would be so great as to stretch the water out into a very meager stream, or breaking with a loud report before it reached the valve chamber, defying the most ingenious to make it work without an increased bore. But, make the bore of the pipe say 4 inches for the upright part and 3 inches for the horizontal length, with joints perfectly air tight, and in my opinion the pump will work satisfactorily and Mr. Edwards' assertion be true.

J. W. Shaffer.

Sterling, Ill.  
If our correspondent will again refer to the page and paper to which he calls attention, and read carefully the article on which the criticism is based he will find that the advice there given is suitable for him and that the position of this paper is correct.—EDS.

#### Paris Academy of Sciences.

At the last sitting a paper was received from M. Soret on solar radiation. The actinometer he uses consists of a thermometer with a blackened bulb, and enclosed in a blackened box. The latter is pierced with a hole two centimeters in diameter, admitting a ray of light which falls on the bulb. The temperature of the thermometer continues to rise until it loses by radiation or by the action of the ambient air as much heat as it receives from the sun. In order to protect the thermometer from the influence of extraneous warmth, the blackened box is surrounded with melting ice. From a series of observations made with this instrument it appears that the moisture of the atmosphere influences the intensity of direct solar radiation; and in general, other circumstances being the same, the more aqueous vapor the air contains, the less intensity there is in the radiation of solar light. Radiation increases with altitude, but its increase is less rapid than the fall of the barometer. The density of the atmosphere being the same, the radiation observed at a great altitude is undoubtedly stronger than at a lower one, and the diminution of radiation as the sun inclines towards the horizon is much less at a high altitude than in the plains.—M. Robb sent in an article on chloride of lime, showing: 1, that all acids displace hydrochloric acid in liquid chloride of lime; 2, their action ceases when the hypochlorous acid set at liberty is not in contact with hydrochloric acid or some oxidizable acid; 3, that if the contrary is the case, chlorine is evolved; 4, and that at all events hypochlorous acid exerts no action on chloride of calcium. In a paper on the electric spark, M. F. Lucas calculates that while the voltaic focus now used for lighthouses is equal to the light of one-hundred and twenty-five Carcel lamps a solitary electric spark, having but an apparent intensity of one-twentieth of a Carcel lamp, would be seen from a greater distance than the voltaic light above alluded to. He therefore recommends the periodical discharge

of strong batteries of Leyden jars instead of the permanent lights now in use.

#### American Champagne in France.

One of the most interesting manufactures of the American Department of the Paris Exhibition is that of the still and sparkling wines, colored and uncolored, which are exhibited by a score of American wine manufacturers. These wines, after being tested by the best judges, have been pronounced worthy of being compared to the most prized productions of France. These sparkling wine comes near to the champagne of the best marks—"Reims," "Epernay," and "Chalons"—and this American manufacture is coming strongly into competition with our own products in the markets of the new world. The grapes which yield this product are the Catawba, the Isabella, the Delaware, the Diana, the Virginia, the Seedling, etc. Six specimens of these sparkling wines have been pointed out by the jury. In the first line stand the samples of Messrs. Werk & Sons, of Cincinnati, Ohio. We understand that in their wines the best qualities of grapes and finest of crystallized sugar are used, and the same skill employed as in the manipulation of the best manufacturers of France. Messrs. Werk, being natives of France, are acquainted with all the minutest details in the cultivation of grapes and the production of wine. The elder Mr. Werk was one of the first promoters of this branch of industry in the United States. Their vineyards are located near Cincinnati.

[We translate the above from *L'Invention*, an excellent monthly journal of science, published in Paris by Charles Desnos. We are much pleased to record this strong commendation of a comparatively new branch of industry in our country, but which has already become very important. There is no good reason why we should depend upon European nations for our supplies of wine, and we think the importation in this branch must gradually decrease, although statistics show the consumption to be greatly increasing.

EDS.

#### Shell Cameos.

The shells employed for cameo cutting are the *cassis rufa*, and several species of cyprea, called cowries. They are dense, thick, and consist of three layers of differently colored shell material. In the *cassis rufa*, each layer is composed of many very thin plates, or laminae, which are perpendicular to the plane of the main layer; each lamina consists of a series of elongated prismatic cells, adherent by their long sides; the laminae of the outer and inner layers are parallel to the lines of growth, while those of the middle layer are at right angles to them. In cowries there is an additional layer, which is a duplicature of the nacreous layer, formed when the animal has attained its full growth. At the London Exhibition there was a very fine collection of shell cameos, from Rome, owned by the engraver Seculina. Certain natives of India prepare shell cameos with rude but efficient instruments for cutting them, and the Indian department in the Exhibition showed numerous specimens.—Dr. Feuchtwanger.

#### A Cement for Iron and other Substances.

A correspondent asks, "What is the best known substance for sticking sheepskin to iron?" We reply, that any fibrous material can be "stuck" to metal, whether iron or other metal, by an amalgam composed of glue dissolved in vinegar, hot, with one-third of its volume of white pitch pine, also hot. The composition will give a sure and certain return.

#### Editorial Summary.

ELEMENTARY EDUCATION IN FRANCE.—One third of all the inhabitants of the French Empire are unable to either read or write. This unwelcome fact has just been forced upon the attention of the enlightened among that nation by the publication of two maps entitled "France that can read, and France that can write." In the latter, the districts in which persons married in 1866 who could not sign the registry—in a proportion varying from thirty to seventy per cent—are marked in black. Fifty-five departments thus denounced comprise all the south, center and west of France. The averages of the illiterate married in 1866 is thirty-three per cent. As regards primary instruction France accordingly is in the lowest rank of the European powers.

TAILLESS CATS.—A correspondent in Sudbury, Mass., informs us of the existence of a race of felines in that vicinity all of whom are destitute of caudal appendages. Tradition ascribes their origin to a farm where many rabbits were kept, and a mixture of races was the consequence. In confirmation of this Darwinian idea our correspondent asserts that the tailless cats of the present generation have the crook of the legs and the jumping gait, characteristic peculiarities of the rabbits. A frightful mortality in every litter of these curiosities tends to prove that by an unnatural effort nature has produced this mongrel race. The generous offer of our correspondent for an editorial cat of this family is gratefully accepted.

WHOOPING COUGH INFECTIOUS.—M. O. Poulet read at a late meeting of the French Academy a paper with this title, in which he stated that during an epidemic of whooping cough which prevailed in his neighborhood, he found in the air excreted by a number of children suffering under it, a vast number of infusoria, identical in every case, and which had the property of communicating the disease to persons inhaling them.

PROFOUNDLY IMPRESSED.—It is reported that during the visit of Abdul-Aziz to the Paris Exposition, he inspected the greatest triumphs of science and art with an air of dignified repose, which was in fact the stupid tranquillity of ignorance. The only thing in the building that caused a smile of intelligence to pass over the Sultan's face was a punching machine in full work, and when told by his interpreter that it was capable of administering one thousand punches a minute, he replied with decided animation that he would take one home with him for the benefit of the heads of those who had persuaded him to leave Turkey.

THE AERONAUTICAL SOCIETY OF GREAT BRITAIN CONTEMPLATE holding an exhibition in May, 1868, of machinery and apparatus relating to objects of an aeronautical character. There are several expensive designs for the accomplishment of aerial transit at this time under construction. It is proposed to offer a prize to any aeronaut starting from any part of continental Europe who shall reach England in a balloon nearest to a given point without replenishing his gas at any time during the days of reception allowed for articles of exhibition.

ANOTHER NEW MOTOR.—An English patent has just been issued for an invention for employing gaseous hydrochloric acid to work on a piston and to produce motion. The gas is evolved from its solution by means of sulphuric acid and after it has done its work it is condensed by transmission through water, then, being liberated from the water by evaporation, it may be used over again any number of times. The parts of the apparatus with which the gas at any time comes in contact must be made of, or coated with glass, to prevent corrosion.

MUSICAL ANTHROPOLOGY.—M. Ketis, of Brussels, has collected an immense amount of documents on the music of the greater number of modern nations, which have enabled him to divide them into several well-defined groups. From the models of flutes and lyres furnished by the pictures on Egyptian and Assyrian monuments, he has constructed instruments with which he has been able to revive musical systems buried for thirty centuries. He hopes from these systems to distinguish races as they have been previously recognized by languages; only less precisely.

THE REMEDIAL PROPERTIES OF GRINDSTONE GRIT.—It is a common notion that the grit of the grindstone has some wonderful quality of healing which does not obtain with the sediment of ordinary stones on which iron is not used, as millstones. There is reason in this opinion, as the *débris* of the grindstone is a mixture of silica and ferruginous oxide. The healing properties of the *débris* of the grindstone lie in the oxide of iron, which, in this form, in some diseases is worth many medical prescriptions.

COMPASSES FOR IRON SHIPS.—The late M. Evan Hopkins has proposed a new plan for remedying the deviation of the compass needle in iron ships, his object being first to neutralize or destroy the polarity acquired by the iron ship while building, and removing the compass from the sphere of attraction exercised by the iron of the vessel. A horseshoe magnet is to effect the first object, and elevating the compass to a sufficient height is to accomplish the other. He proposed to place a reflector near the elevated compass, in such a way that the card may appear like the face of a clock, and be capable of being read at the distance of twenty feet from the helm.

Poisoning by PHOSPHORUS.—M. Dybkowsky, in a recent memoir states that the poisonous action of phosphorus is entirely due to the formation of phosphorescent hydrogen gas, which, in passing into the blood, rapidly combines with the oxygen present. Hence he concludes that death from phosphorus is nearly equivalent to death by asphyxia.

A COMIC paper called the *Philosophie* recently appeared on the streets of Paris with a large portrait of Bismarck, representing him as an ogre in the act of sharpening a knife to devour little children. The sale was prohibited, and the police seized all they could find. Bismarck is not much loved in Paris, but he is more feared than any other man in Europe.

CORRECTION.—In our answer to H. L. W. of Pa., on page 263 No. 17, present volume SCIENTIFIC AMERICAN the matter reads that the grate surface of a boiler per horse power is "six square inches." It should have been "half a square foot," a mild difference of only 66 square inches.

SPONTANEOUS COMBUSTION.—A fire recently occurred in the woolen mills of Messrs. Annens and Minot at Elbeuf, France, which was caused by the spontaneous combustion of a heap of refuse wool impregnated with oil. The SCIENTIFIC AMERICAN has frequently warned manufacturers of this source of danger.

PLAYERS' PATENT HOT OVEN, illustrated in our paper a few months ago, has been put into practical operation in this country with great success by Horace L. Brooke, of Baltimore, Md. The use of this oven is said to effect a clear saving of \$10 a tun in iron smelting.

DR. R. J. GATLING, inventor of the celebrated Gatling gun, sailed for Europe on steamer *Persire*, Oct. 19th.

**American Toys, where Made.**

A writer in the *Commercial Advertiser* has been investigating the business of making various kinds of toys, with the following result:

"The tin toys used in this country are now nearly all made in Meriden, Conn., where large quantities of tin household goods are also manufactured. It occurred to the makers of these latter that their scraps could be advantageously used for toy objects, and with the advantage of labor-saving machinery, they have driven their German rivals from this market.

Wooden toys of the less fragile kind are largely manufactured in several Connecticut towns. These consist of children's wheelbarrows, drums, rocking-horses, carriages, carts, blocks, rail cars, hoops, sleds, etc. Many of these objects are also made in this city and Philadelphia.

The new sensation toys, as the dancing negro of a few years back, and the present returning ball and Quaker popgun, are all made here. The patentees of these articles are said to have made fortunes. The railroad train and several other new toys, in great demand when first presented, have also been mines of wealth to those who patented them. The red india-rubber balloons are made in France, and filled here with gas. They are by no means strong, and the gas soon escapes.

Pewter toys, comprising soldiers, landscapes, trees, etc., are now largely made in this country, and though many are yet imported from Germany, their manufacture continues to be a profitable branch of business. New York monopolizes much of this industry. An Italian firm during the war realized a considerable sum by the manufacture of toy tea cups and saucers, the chief material of which was lead.

The stuffed bodies of dolls are made in New York, Boston and Philadelphia, as also the arms; but Germany still sends many. The arms of stuffed dolls are an especial article of commerce. They are not, like the legs, attached to the bodies, but are sold separately. Families will often make the bodies and legs for their children, but buy the arms on account of the difficulty of making fingers. The heads are likewise purchased, and are either of French porcelain and finely featured, or of German china or papier mache, or English wax, or American india rubber, or of a new imitation of papier mache lately patented in Philadelphia. This latter is of thin layers of muslin, coated with oil paint, which has the advantage of washing without injury and is exceedingly strong, though by no means of fine finish.

India rubber hollow toys of every description, except balls, are said lately to have drooped in sale. Grotesque birds and men that squeaked when squeezed, seem to no longer to charm by their music.

The india rubber dolls' heads, lately much in use, are superseded by the new Philadelphia article spoken of.

Large mechanical toys, such as velocipedes, imitation steam engines, steamers, etc., are made here; as also kaleidoscopes. A negro jig dancer, propelled by steam, is the latest Yankee notion. A kerosene lamp heats a small brass vessel full of water and shaped like a top. It revolves in its socket, and moves a wire which communicates with the figure.

Aside from those we have mentioned, and a few others, most of the objects seen in a toy store still come from Germany. Children are largely employed in their preparation there, but American children go to school. It is surprising at what an early age German children are availed of in this respect. At six years, there, certain simple duties are performed by them upon portions of toys. Farmers of two or three acres employ their entire families in toy making during the winter months. The result of this labor is seen in Noah's arks. A youngster of very tender years paints the bodies of Noah's family and the animals with one color, and another child, a little older, dots the artistic countenances, or daubs patches of varied colors on the bodies. Wooden dolls are mostly made in Germany by the country people. Marbles come exclusively from Saxony, and are prepared in molds by machinery, from a clay not found in other countries. The material for agate marbles is obtained in the Hartz mountains of Germany.

A Japanese top has been lately in vogue, and several Chinese toys have been for years in use. It is worthy of notice that the hints for toys manufactured for generations past in Germany have been usually taken from China.

Croquet instruments are made in Pawtucket and Providence, Rhode Island, and in Boston and Springfield, Mass.

Maple is the wood principally used, though lignum vitae is sometimes employed. For most expensive kinds boxwood is the material. This has become an immense business, and is likely to continue so, as croquet is yet by no means as common a game in the South and West as in the East. Small balls, for parlor use during the winter months, are also made. The new game of martelle employs the same woods. The parlor balls are of ivory.

There are few better or less explored fields for fortune than the invention of toys, and ingenuity seems constantly drawn in that direction."

[The number of applications for patents in toys, during the past few years, has been gradually increasing. We never knew a patentee of any kind of a toy that did not make money out of his patent.—Eds.]

**Marmalade.**

A paper was read in the British Association on the "Confectionery and Marmalade Trade of Dundee"—a trade which has been in existence for seventy years. Some curious facts were stated which we copy:

The quantity of marmalade made in Dundee at the present time amounts to above 1,000 tons annually, for the produc-

tion of which more than 3,000 chests of the finest bitter oranges are used.

These are imported from Seville, as it has been found that the oranges grown in and around that city possess a peculiar and agreeable aroma, which renders them better adapted for the purpose than those of any other district either in Spain or Italy. When the marmalade is prepared, a sufficient quantity of sugar is added, to preserve it thoroughly, without in any degree impairing the flavor. About four hundred persons are directly employed at the Dundee confectionery works, and it may be added that occupation is furnished to many more in connection with them. For example, one of the Newcastle potteries is to a large extent employed in turning out the well-known printed jars for marmalade. Of these there are about one and a half millions required every year, costing upward of £6,500. The marmalade season, as it may be called—that is, the period during which all that is required of this preserve for the year's supply must be made—usually continues about four months, viz., from the beginning of December to the end of March.

The manufacture of confections is also carried on on a very large scale, and embraces an immense variety of lozenges, comfits, candied peels, etc., to supply the constantly increasing demand both for the home and colonial markets. The quantity of sugar, chiefly refined, used for the confections, marmalade, and preserves made in Dundee, it would be difficult to estimate; but it probably amounts to two thousand tons annually.

By way of giving a scientific term to the paper, the writer stated that "the word 'marmalade' is supposed to be derived from an Indian fruit not unlike the orange, called the *Algo marmelos*, or Indian *bael*, from which at one period, a similar conserve seems to have been made."

**MEYER'S SAFETY SADDLE.**

The object of this saddle appears to be not only to make an easy seat for the rider and a comfortable appliance for the horse, but to insure safety, in case of the fright of the horse,



to his rider. The contrivance seems to be well adapted to these ends. The frequent accidents occurring from the entanglement of the foot in the stirrup, the fatal consequences of being drawn by the foot, as was Achilles by Priam, seem to demand some arrangement by which the rider can extricate himself from a very bad situation.

The saddle in the engraving is made to fit the horse, the frame being of iron instead of wood. But the improvement is mainly in the appendages to the saddle. The stirrup strap is in two parts and connected to the saddle proper by means of a metal strap secured in the leather of the strap proper, and held in place by a spring catch, seen in the engraving under the saddle flap. The strap is in two parts and swivelled at A, so that it may be turned in any direction. At B is another spring catch which allows of a raising or lowering of the stirrup. By the use of the upper catch the stirrup strap may be instantly disengaged, so that if the rider is in danger of being thrown he or she may disengage the strap to prevent being caught when thrown or leaping from the horse. The stirrups are hinged to accommodate themselves to the action of the foot. It was patented through the Scientific American Patent Agency Sept. 18, 1867, by Jacques Meyer, 104 Ewen st., Williamsburg, N. Y., who will answer all inquiries relative thereto.

**A Shaft in the Oaks Colliery.**

Number two shaft is in a condition different from that of number one. Great timbers secure its sides, and the eye can penetrate it but to a very little distance. This is the main way to the workings, and was with immense labor choked up and stopped soon after the calamity. But what is going on in the great mine is not left entirely to be guessed at. Penetrating the mass of material used in blocking the shaft, is an iron pipe of the circumference of a dessert plate with a

secure groove-lidded top. This extends right down to the subterraneous ways where are still entombed three hundred human beings and forty horses and ponies.

The object of this pipe is that the gas in the terrible place may be measured as to its strength and quality, and to this end outside the big pipe there is affixed an indicator, and every hour note is taken of the pressure shown, and entered in a book. This is part of the night watchman's work. "I should imagine that the gas must have been well nigh exhausted by this time," I remarked. "You never were more mistaken; come up here and see for yourself." was the obliging reply. "Up here" was up a short ladder, and after depositing his lamp ("safety" though it was) at a considerable distance, my guide led the way. I did not see him take the lid off the pipe, so I cannot explain how it was done, but I knew the moment that it was done by the strong blowing. "Put oop you han' mon, and feel it." This I did, and whistling through my fingers the foul blast made them feel as though webbed. "Put thy face over mon—just a instant; keep thy mouth shut." And this, blockhead that I was, I likewise did. It was only for an instant, and without doubt I shut my mouth. But where was the use of such a mild precaution against so insidious an enemy? I must have closed every pore of my skin to have escaped its poisonous influence. I paid the penalty of my rashness. Breath of death as it was, it crept into me, and not that night nor next day but the day following, it roused in its lurking place, and, alas! the twisting it gave me! I never yet was seasick, but if that affliction is a tenth as horrible as mine-gas sickness, commend me everlasting to the land.—James Greenwood.

**Europe on the Western Hemisphere.**

It may be interesting to know what territory in this hemisphere is claimed by European nations. The *Hartford Courant* says: The European nations owning territory in America are six in number—England, Spain, France, Holland, Denmark, and Sweden. To England belongs all the territory north of us known as British America, as also the Bermudas, the Bahamas, Jamaica, several small West India Islands, English Guiana in South America, and the Falkland Islands. These embrace altogether about one hundred and fifty thousand square miles and a population of nearly five millions. France owns St. Pierre and Miquelon, a small group of islands off the coast of Newfoundland, Martinique and Guadeloupe among the West India Islands, and French Guiana in South America. The population of these possessions is three hundred thousand. Spain owns Cuba, Porto Rico, and the Spanish Virgin Islands. This last scanty remnant of a domain, which once included half of South America, and a quarter of North America, has a population of less than two millions. Holland rules Surinam or Dutch Guiana in South America, and a few small islands of the West Indian group. The number of their inhabitants is not one hundred thousand. Denmark is in possession of the three West Indian islets of St. Croix, St. Thomas and St. John, with a population of thirty-eight thousand; while Sweden exercises sway over the petty adjoining isle of St. Bartholomew, containing but twenty-eight hundred souls. It will thus be seen that the people subject to foreign domination in the New World does not amount to so much as a third of the population of our country alone. Of the six foreign powers only one, England, has a foothold on the mainland of North America; while only two others, France and Holland, have possessions on the continental portion of South America.

**Toads.**

The paper on "Toads," in *Harper's Magazine* for October is original and descriptive, and does justice to a much maligned member of the animal creation, for whose bad name Shakespeare and Milton are largely responsible. We quote a passage, which informs us why toads are so cold. The writer says: "The abundant moisture and coolness of the toad, so essential to his health and comfort, help to make him disagreeable to us. As the moist coolness of a dog's nose startles any one who feels it unexpectedly or in the dark, so does the invariable dewy cold and clammy sweat of the toad, when touched, offend many a civilized simpleton. I say civilized, remembering that the black barbarians of Senegal, avail themselves of this perpetual coolness produced by the abundant moisture and rapid evaporation on the skin of toads, are in the habit, as Adamson informs us, of applying toads to their foreheads as they traveled in torrid heats over burning sands, on the same principle that Roman ladies of the imperial age carried cooling pots in their hands and bosoms in the form of living serpents; or that the languid beauties of Turkish seraglios pass between their fingers the refrigerating fragrant beads of their amber tusbees."

"In every toad there is a sack of pure water, not at all connected with the kidneys, but serving as a reservoir, and furnishing, doubtless, a part of the fluid which perspires from the skin. This fluid is very harmless in the common English and American toads. So, also, is the liquid which is largely secreted by the bean-shaped bunch on each side of the toad's head, as well as that which is so freely ejected when you suddenly grasp a toad in your hands. Most persons are afraid of these fluids, and imagine them poisonous. They are mistaken. Not even Macbeth's weird sisters could now find venom in the common toad. It is true, however, that these juices have a slightly irritating effect when applied to the eyes, or to a flesh wound, and that cat or dog does not like to take a second taste. But they are substantially harmless."

**COMPOSITION OF BRITANNIA METAL.**—Ordinary Britannia metal is composed of equal parts good red brass, antimony, tin, bismuth, and lead.

**PROGRESS OF THE PACIFIC RAILROAD--THE SYSTEM  
ADOPTED FOR LAYING THE TRACK.**

A correspondent of the *Evening Post*, writing from Omaha, under date October 11, thus describes the progress of work on the great Pacific Railroad and the mode of laying the track.

To the people of the East the Pacific Railroad, building thousands of miles away in a desert country, and meeting obstacles only to overcome them is a great enterprise; but to the western man it is the one great topic of conversation. In fact, almost every man here is in some way personally interested in it, either actually working on the road, or getting out ties, or cutting cord wood, or in some one of the numerous contracts connected with it.

**THE DIFFERENT PACIFIC RAILROADS.**

Here is a Union Pacific and a Central Pacific, and a Union Pacific Eastern Division, and a Northern Pacific, and a Southwestern Pacific. Of these the Union Pacific, and the Central Pacific are the great Pacific Railroad we read about, and when completed will form one continuous line from Omaha to Sacramento. The Union Pacific has already completed nearly five hundred miles west, commencing at Omaha and the Central Pacific is in running order more than a hundred miles east of Sacramento. They will unite somewhere about Salt Lake City. Both roads have government assistance and both roads have their bonds in market. The Union Pacific Eastern Division, starting from Wyandotte, Kansas, follows the Smoky Hill route, passes through Leavenworth and Topeka, and is now in running order to a point called Ellsworth, about two-hundred and twenty-five miles out.

It is this road that has been threatened by the Indians, and to the building of this that Ragged Shirt Tail and his companions object. This road also receives government assistance, and as now projected will strike the Union Pacific at some point west of Denver, and will be a sort of branch of it. The Southern Pacific, starting from St. Paul is as yet hardly under way, and the southwest branch running from St. Louis to Rolla, and thence by way of Santa Fe, through Southern California to San Francisco, is in about the same condition. The Northern Pacific is not intended to strike San Francisco, but rather Portland or some city in Oregon, and the Southwest Branch very likely will make some point lower down on the California coast its western terminus. But while these other roads are debating what route to take, or how to raise the funds to build the road with, the Union Pacific has thoroughly built and equipped nearly five hundred miles of road, is already within a hundred miles of Denver, and although running through a waste of wilderness almost uninhabited, more than pays its expenses.

**WEST FROM OMAHA.**

You get into the cars at Omaha at six in the evening. There is nothing in the passengers to remind you of the extraordinary nature of your trip, unless it is that almost everyone has a rifle, and that the conversation smacks of buffalo, and the miners, and frontier adventures. Comfortable sleeping cars are attached, and when you wake up in the morning we have passed Fort Kearney and are fairly on the Plains. As far as you can see to the right is one broad unbroken expanse of plain. On the left is the Platt with its bluffs, and here and there a straggling willow or cottonwood. But we have passed the region of timber, and shall see no more until we come to the present end of the road beyond Antelope, where on the bluffs a few stunted cedars and pines wrestle with the winds for their existence. The "Plains," in the sense in which the word is generally used, means all that immense tract of country which is without timber and without water. Sometimes this is an immense prairie, level as a floor and covered with waving grass; sometimes a plane hemmed in on either side by barren bluffs. Rain seldom falls here, and it is only available agriculturally for stock raising. After leaving Fort Kearney no farms are to be seen, but instead, now and then a scared antelope starts up and makes off over the plain, and the immense horns and the bones of buffalo lying along the route show where they have been killed. At Fort Kearney four Englishmen came aboard the train who had been out on a five days' hunt, and had killed fifty buffalo. The tongues they cut out, and the carcasses they left. They did not want the meat, and they only killed them for the sport of the thing. It is just this wanton waste of useful life that so enrages the Indian, and excites an anger which is vented on the first white men he is strong enough to overcome.

**HOW THE TRACK IS LAID.**

Breakfast is over and work commences at half past six, but it is not till seven that it is fairly under way. We shall only see the track-laying to day, for the grading, which is a separate part of the work, is already completed to Cheyenne, thirty miles ahead. The work of track-laying is divided into three parts--the tie-laying, the track-laying proper, and the bolting and spiking.

**THE TIE PLACERS.**

First come the engineers, who fix the line of the ties, determining where they are to go; next a set of skilful workmen who put down a few ties at the proper level, enough to determine the position of the rest of the ties, and finally the great body of the layers, who fix the remaining ties on the level of those already down--workmen follow, throwing in dirt and ramming it down, and all is then ready for the track-layers. These are a gang of ten stalwart fellows, in whose work is the great attraction. Taking an open truck of a car, they run it back to where the rails were dumped off of the supply train, and load it with rails and the proper number of joints and spikes. A couple of horses are then hitched to the car and haul it to the end of the track, when they are unhitched and sent back for another load leaving in their place

a small but intelligent horse, that performs his work with great steadiness and zeal.

**THE RAIL LIFTERS.**

The truck being at the end of the track and the wheels blocked, at a word from the foreman five men on each side seize a rail and pull it out over the front of the car to its full length. "Down," sings out the foreman, and down comes two rails into their proper places on the ties. In an instant the man at the farther end has applied a measure and adjusted the width, the man next the car has whipped out the blocks, the little horse knows that now it is his turn and strains and pulls, and the car runs over nine yards more of the Union Pacific Railroad. "Whoa up!" the horse stops, the wheels are blocked, again two more rails are seized, "Down" cries the foreman again, and down come nine yards more. It is very exciting to watch this work, but you can't keep still. Every fifteen seconds the voice of the foreman rings out sonorous "Down," and every fifteen seconds another set of rails respond with heavy clang. Occasionally a rail comes out that is not perfectly straight. In this case instead of putting it down, one end is rested on the truck, all the men steady it, and a mighty Hercules, seizing a tremendous sledge hammer, deals it such blows as soon reduce it to its normal line.

**THE RATE OF BUILDING.**

Nine yards in fifteen seconds! Great heavens, what a pace! This is thirty-six yards a minute; nearly a mile and a quarter an hour. At this rate, counting ten hours a day for work, and estimating the distance to Sacramento at one thousand six hundred miles, the work would be done in a little more than four months. But follow the truck along, and you will see why it is that this pace is not kept up, and why two miles a day is about an average of the work. A truck carries thirty rails. It exhausts its load then after dropping fifteen sets of rails, and must go back for another. This is what takes time, for the rails are heavy and slow to be loaded, and the truck must be run back to the point where they were unloaded from the supply train. As the track advances, this point recedes, and the truck must be run further and further back each time until a new load can be dumped off nearer.

This and many other difficulties reduce the track laying to an average of about two miles a day. In September, owing to the want of bolts and spikes, only ten miles of track were laid. The most constant forethought and the greatest energy are necessary to keep always ready rails enough, and bolts enough, and spikes enough, and the thousand and one articles, the want of any one of which would stop the work. And indeed, considering that the iron comes from all over the country, much of it from New England; that the ties are brought from wherever they can be got, many from Michigan, Minnesota and Wisconsin; that everything must be transported by a single line of track to Council Bluffs, thence across the uncertain Missouri River in boats, and again five hundred miles to their destination, and that the daily consumption of rails alone for two miles progress is two hundred tons, and of ties five thousand two hundred and eighty, and of everything else in proportion--considering all this, I say, the wonder is not that the progress is not greater, but that it is as great as it is.

**THE BOLTERS.**

But to resume: The track laying I have described only leaves the rails in their places, resting there by their own weight. Close behind the truck from which the rails are laid come two men who place at each jointing of the rail a clamp, and at each sleeper two spikes. These clamps, called the Fish clamps, consist of two pieces of strap iron, which are placed lengthwise of the rail and in the hollow of it, and are bolted together by bolts passing through them and both rails. The rails are thus securely fastened together and form one continuous piece of iron. Close behind the clamps come the spikers, who put in enough spikes to hold the rails in their proper position until the main body of spikers come up, when the exact width of the rails is fixed, the sleepers finally settled, and the last spikes driven home--and the work is done. This is the main work, but a dozen branches of it are going on all at the same time. Fifty mule teams are constantly hauling up sleepers, water carts are making constant trips to supply the whole establishment with water. Bridge men, three or four miles ahead, must permit no delay from bridges, and the telegraph must be the *fides Achates* of the railroad. Every twenty miles a water tank is to be constructed, and wood wherever it can be got must be cut up and hauled for the engines.

The Rocky Mountains are now in sight. Thirty miles further and Cheyenne will be reached, and it is hoped the Black Hills this fall. The winter will then set in so as to prevent further work this year. But next year, when spring opens, it will again go on and with renewed energy. General Dodge, the Chief Engineer of the road, who has just returned from a six months' exploration of the mountains, reports finding an easier grade and an abundance of excellent coal. Already steps are taking to form a new territory, to be called Wyoming, and to be made up of parts of Colorado, Idaho, Dakota and Nebraska. Build the railroad, and the railroad will populate the new territory.

**Restaurants of the French Exhibition.**

Of the many singular features of the French Exhibition, now drawing to a close, nothing is more striking than the elegant restaurants that surround the building. A certain amount of space was appropriated for this purpose to the various countries that had departments in the Exhibition, and the restaurants were fitted up, supplied and served in accordance with the tastes and customs of these varied nationalities. A Frenchman can get his coffee, wine and bread, a German his beer, sausage and sour kraut, a Yankee his sherry

cobbler, and pumpkin pie, the Englishman his beef, mutton and pale ale, and so on through all the whole list of edibles which the science of gastronomy can suggest to satisfy the appetite. At midday the work begins, and for two hours the music of crockery and the rattle of knives and forks seems to absorb the attention of everybody.

It is doubtful however if these restaurants have success in a financial point of view. The Paris journals already announce that the chief *restaurateur* of the French Department is a bankrupt, and that his liabilities are \$300,000, and there is considerable grumbling on the part of the waiters in some of the others that their wages have not been paid, and a general collapse of empty purses is expected to crown the enterprise.

**MANUFACTURING, MINING, AND RAILROAD ITEMS.**

The total silk production of California for 1867 is estimated at 216,000 cocoons and the supply of mulberry far exceeds the demand. The business is quite profitable just now, but the silk men are advancing cautiously.

The "swamp angel" which during its service before Charleston, S. C. gained a great notoriety, is now lying at a machine shop in Trenton, N. J. awaiting its turn to be broken up and fashioned into more peaceful and useful implements.

Fire-clay, rivaling the best deposits of Europe, is found within four miles of St. Louis. The bed is fifteen feet thick and very extensive. Fire brick made of this clay is capable of resisting very high temperatures, and is excellent material for retorts, alembics, crucibles and furnaces.

The Missouri and Mississippi railroad is now under construction. The charter provides for the building of a road from Macon, on the North Missouri railroad, to the mouth of the Des Moines in the northeast part of the State, where a connection will be made with the Iowa system of railroads, and with those of Illinois by means of the road which terminates at Warsaw on the opposite side of the Mississippi river.

The marbles of Vermont have become one of its chief sources of wealth. The quarries and mills near Rutland, supply a large per cent of the marble of domestic production which is used in this country for statuary, monumental and other purposes, where a fine grade is desired. A capital of several millions of dollars is employed in the business, and a large proportion of those who have embarked in it have been in an eminent degree successful.

Among the new manufactures put in operation in San Francisco during the past year are the Pacific Woolen Mills for manufacturing knit goods at the rate of \$600,000 annually; the Golden city chemical works with a capital of \$2,000,000, for preparing a great variety of chemicals and medicinal extracts; the San Francisco Glass Works for making white and colored glass to the extent of \$150,000 a year, and the new Linseed oil and Paint Works, with capacity to supply the whole Pacific coast. These with minor enterprises inaugurated during the same period have absorbed more than \$8,000,000 capital and will turn out manufactures to half that amount yearly.

The elevation of Iron mountain, Missouri, is 228 feet and the area of its base 500 acres. The solid contents of the cone are estimated at 230,000,000 tons.

In Mexico there exist 107 different kinds of minerals among which are gold, silver, iron, copper, lead, zinc, mercury and tin. The following are said to be peculiar to that country: Rhodium, gold silenit of mercury, zocchilite, jalapite, jodyrite, coquimbo, planite, silver obsidian, and vanadite.

A British consul in Japan gives a remarkable account of the wealth of the lead, iron and coal deposits in the island of Yesso. In one place coal forms the sea cliffs, and in another he walked four miles over an iron sand which contained over 60 per cent of metal. There are also indications of gold and copper.

Very singular and quite complicated railroad accident, or series of accidents occurred last month on the line between Manchester, (Eng.) and Derby. A cattle train of twenty-three cars entering the Peak Forest tunnel came into collision with a gravel train which had preceded it. One life was lost and much damage done, but the mischief did not end here, for both trains were standing on a steep incline, down which the recoil started the remaining cattle cars. An express train was standing on the rails and seeing the trucks approaching, the engineer reversed his engine and jumped off, but before the express had retrograded many rods a second collision ensued, the express train then continuing to back at a furious speed until stopped on an up grade by the loss of steam.

**Recent American and Foreign Patents.**

*Under this heading we shall publish weekly notes of some of the more prominent home and foreign patents.*

**INDICATOR FOR PUNCHING MACHINES.**—W. Welch, Bridgeport, Conn.—This invention relates to a new device by which the number of strokes of punches, shears, milling machines, and all such machines, in which reciprocating motion is generated by rotating motion, can be registered, said device being so arranged that the registering apparatus can be put at rest when it is not desired that the strokes should be counted, as for instance, for lubricating, repairing, and testing purposes.

**MANGLING MACHINE.**—Johan Johansen, Springfield, Ill.—This invention has for its object to furnish an improved mangle, simple in construction, strong, not liable to get out of order, and which will do its work quickly and well without injury to the fabric.

**HORN COUPLING.**—Moseley S. Curtis, New York City.—This invention consists in securing the parts of the coupling to each other by sliding blocks, and in operating said blocks by means of eccentric grooves formed in a movable part of the coupling.

**ARCH BARS AND DOUBLE ANDIRONS FOR EVAPORATING CANE JUICE, ETC.**—Gains S. Deane, Grand Rapids, Mich.—This invention has for its object to furnish improved bars and andirons designed especially for farmers' use in supporting their evaporating pans and fire wood in arches built by them in the sugar bush for manufacturing sugar, but which are equally useful in other situations.

**CARRIAGE CLIPS.**—Edwin Meeker, Bridgeport, Conn.—This invention relates to certain improvements in the manufacture of carriage and coach clips, and consists in forming the same by means of dies, while they were heretofore made by hand.

**FINE-TOOTH COMBS.**—James H. Briggs, Brooklyn, N. Y.—The object of this invention is to so arrange a metal strip or band on fine-tooth combs, that the said combs may thereby be strengthened, or that two half combs may thereby be united to make one.

**COMPOSITION FOR ROOFING.**—Andrew F. Jackson and Otis Pratt, Warsaw, Ind.—The main feature in this invention is the use of a mineral found in great quantities near Dayton, Ohio, in combination with tar, sulphur, plumbago, and litharge, as a roofing material.

**PROPELLER AND CURRENT WHEEL.**—A. B. Smith, Yankton, Dakota.—This invention is a device which can be used as an endless chain propeller for steamboats, or as a water wheel to be rotated by a running stream for the purpose of furnishing motive power to drive machinery.

**LOCK FOR FIRE-ARMS.**—Wm. F. Kussmaul, Baltimore, Md.—In this invention a spring stop is provided, which catches under a shoulder of the hammer and holds it up from the cap when the gun is not in use. When the gun is cocked the spring stop automatically retreats and leaves the hammer to descend upon the cap.

**COMBINED COTTON PRESS AND FEEDER.**—Henry Zellner, Columbia, Tenn.—In this invention the ginned cotton is fed to the machine through a chute in which it is cleaned from dust. It is then forced into the press under the

follower, which presses it to the bottom of the tube, where it is held down by a novel device while the follower returns for a second tubatui. This process is repeated till the bale is completed.

**SAUSAGES.**—Jacob L. Chevalier, Newark, N. J.—This invention consists in combining fish, either fresh or salted, with pork or lard, and with or without potatoes, for preparing the article of food known as sausages.

**LADY'S TATTING SHUTTLE.**—Sils Schofield, Plainville, Mass.—This invention consists in attaching the shuttle to a holder, and providing for winding the thread on the shuttle by a key or crank, thereby greatly facilitating the operation.

**WIND MILL.**—E. W. Mills, Syracuse, N. Y.—This invention relates to a new and improved method of controlling and regulating the power of the wind and to its application to a pump or other purposes.

**ARTIFICIAL LEG.**—Henry L. Mills, St. Paul, Minn.—This invention relates to an improved method of constructing an artificial leg, and consists in several devices and arrangements for securing comfort and convenience to the wearer and making a strong, cheap, and durable artificial limb.

**TRANSPLANTER.**—C. R. Disbrow, Bath, N. Y.—Patented Oct. 8, 1867.—This invention relates to a new and improved mode of constructing an implement for the use of gardeners in transplanting plants and shrubs, to remove them with the soil in which they grow without disturbing the roots.

**SCISSORS.**—J. A. Althouse, New Harmony, Ind.—Patented Oct. 8, 1867.—The design of this invention is to combine a buttonhole cutter with an ordinary pair of scissors, for the sake of convenience and economy.

**APPARATUS EMPLOYED IN THE PREPARATION OF COTTON AND OTHER FIBROUS MATERIAL.**—Wm. Hamer, Little Lever, England.—Patented Oct. 8, 1867.—This invention relates to the removal of the silver from the case or collar, and consists in placing underneath the material a spring of metal, so that as the silver is removed from the top of the case or collar its lower portion is raised upward by the spring, and thereby prevents breakage.

**APPARATUS FOR OILING PROPELLER CRANKS.**—Jesse Davis, New York City.—Patented Oct. 8, 1867.—This invention is designed to obviate the difficulty of oiling journals of propeller cranks and other inaccessible parts of machinery, and provides the means of lubricating them with regularity and certainty and no waste of oil.

**LOOM.**—H. D. Hunt, Danville, Ill.—Patented Oct. 8, 1867.—This invention relates to an improvement in hand looms, and consists in connecting moveable plates and levers attached to the lay with the breast beam and the shuttle devices, in such manner that the movement of the lay shall operate on the devices to throw the shuttle and other devices connected with the take up of the cloth beam and the working of the treadles and yarn beam.

**CULTIVATOR COUPLING.**—Joshua Pierpont, La Harpe, Ill.—Patented Oct. 8, 1867.—This invention relates to an improvement in the axle and coupling of cultivators, and consists in casting the arms of the axle with a longitudinal groove on the upper side of each, for receiving the ends of a wrought iron connecting bar and a box or boxes on the under side, for receiving a turnable clevis.

**BUCKLE.**—A. H. Hopkins, Goshen, Ind.—Patented Oct. 8, 1867.—This invention relates to an improved plan of construction in metal buckles for harness leather, or straps of any kind, and consists in forming a rectangular buckle with two tongues, one at each end, hung upon a center bar on opposite sides, in opposite directions, and each tongue provided with a tack loop for the end of the strap.

**HAY FORK.**—B. F. Stewart, Cadiz, Ohio.—This invention relates to an improvement in the construction of hay forks, and consists in attaching two curved tines or prongs to a handle by a pivot, on one of which prongs is pivoted a link that is connected with the other prong by a wrist working in a slot, the parts being so arranged and operated that when the prongs are closed they can be pushed into the hay, opening as they penetrate into it, until they are fully expanded to take up a load, which, upon being lifted by the handle and deposited in place in the usual way, is released from the fork by drawing with a hand rope upon the link that connects the prongs in order to close them again.

**DEVICE FOR CAPPING SCREW.**—Orrin W. Swift, New Haven, Conn.—This invention relates to a new and improved device for capping screws, that is to say, covering the heads of the screws with a white metal cap, and closing the edge of the same all around underneath the edge of the head, and at the same time pressing the portion of the cap over the neck in the screw head directly into the neck without cutting away the cap over the neck as is now done.

**Oil CAN.**—Charles Williams, Vineland, N. J.—This invention relates to a new and improved oil can of that class which are used for oiling machinery, and are generally made small or portable. The invention consists in the application of an elastic tube to the interior of the nozzle of the can, the tube being loaded with a weight at its free or disengaged end, whereby all of the oil within the can may be expelled from it, and the oil prevented from leaking out of the nozzle in case the can be casually upset.

**HUB AND AXLE FOR VEHICLES.**—D. M. Buckhart, Mount Kisco, N. Y.—This invention relates to a new and improved metallic hub and axle for vehicles, and it consists in a novel construction of the hub whereby the spokes may be firmly secured in it, the hub allowed to turn on its axle with but little practice, and the whole rendered capable of being adjusted at a greater or less distance apart, as may be desired, and other advantages obtained.

**CART SADDLE.**—John Bea, Newark, N. J.—This invention relates to a new and useful improvement in saddles, which are used with cart harnesses, and by which the horse is made to sustain a portion of the load of the cart. The invention consists in a novel manner of constructing the saddle, whereby the same may be manufactured at a much less cost than hitherto, and equally as good a saddle obtained.

**TIE FOR BALD HOOP.**—J. L. Sheppard, Charleston, S. C.—This invention relates to a new and improved tie or lock for connecting together the ends of bald hooks, after the bale has been properly compressed. The object of the invention is to obtain a tie or lock for the purpose specified, which will admit of the ends of the hoop being readily connected together, and which will also admit of bales being repressed without detaching the hoops from the bale, or the tie or lock from the ends of the hoops.

**GRAIN-DISCHARGING DEVICE FOR REAPERS.**—E. H. C. Preston, Manlius, N. Y.—This invention consists of a revolving toothed head or shaft applied to the platform of a reaper in such a manner that it will receive the grain as it is cut, and when a sufficient quantity of grain has been deposited upon it, be capable, by a semi-revolution, of discharging the grain from the platform without the liability of becoming choked or clogged, and without tangling the grain.

**PANEL TABLE.**—J. G. Greene, Port Henry, N. Y.—This invention has for its object to so construct the panel ends of sewing machine cases, and other articles of furniture, or the paneling at the side of a room, or beneath a window, that it may be drawn out and form a table.

**GOPHER TRAP.**—John Curtis, St. Charles, Minn.—This invention has for its object to furnish an improved trap for catching gophers, which shall be simple in construction and effective in operation.

**TERRASPHERE.**—Elaszer Root, Indianapolis, Ind.—This invention relates to improvements in the terrasphere, for which letters patent were granted on the 18th day of December, 1866.

**HAY RAISING AND LOADING DEVICE.**—Hosea Willard, Vergennes, Vt.—This invention relates to a certain new and useful improvement on a machine for raking and loading hay, for which letters were granted, bearing date August 1st, 1866. The invention consists, 1st, in an improved means for discharging the elevated hay from the upper part of the endless elevator, whereby the hay is discharged at the point specified, in a perfect manner. The invention consists, 2d, in an improved application of the endless elevator to the machine, whereby the teeth of the elevator are allowed to yield or give perfectly to obstructions which may be in their path, or yield to inequalities of the surface of the ground. The invention consists, 3d, in the application of wing rakes to the machine, and endless feeders or conveyors connected therewith, whereby the machine is made to operate over a comparatively wide area, and rendered available for raking up and loading hay as left on the field by the moving machine.

**WAGON BRAKE.**—L. E. Woodard, Owosso, Mich.—This invention relates to an improvement in the construction of brakes for wagons, and other vehicles, and consists in attaching a brake bar to the reach to act upon the wheels by means of an eccentric headed lever or cam, in such manner that the brakes may be quickly and powerfully applied, and instantly disengaged from the wheels to relieve them from pressure by a slight movement of the eccentric lever.

**SMOKE STACK.**—Patrick Kelly, Nashville, Tenn.—This invention consists in placing within the chimney or smoke stack certain arrestors, defectors, and conductors, which not only prevent the escape of the sparks from the chimney, but collect and discharge them.

**DUMB WAITER.**—T. B. Bryson, Newcastle, Pa.—The nature of this invention consists in constructing a portable dumb waiter, easily fitted in a dwelling house for opening up through the floor of an upper room, over another room or cellar, without requiring a closet to inclose it, or occupying space in the upper room permanently.

**MOLE TRAP.**—John Westcott, Patchogue, N. Y.—This invention relates to an improved mole trap, and consists in a pair of forks pressed together by a spring. These are kept apart by a metal dog, the trap set lengthwise, in the channel made by the mole in the ground.

**EXPANSION DRILL.**—Gilbert Mackinnon, Portsmouth, N. H.—This invention consists in attaching expandable cutters to a suitable cutter holder and expanding the same by a wedge and screw arranged so that by turning the nut on the screw the size of the tool can be varied.

**BALING PRESS.**—Geo. H. Hoke and John A. Brown, Elizabeth, Pa.—This invention relates to an improved baling press, for hay, cotton, or other substances, and consists in improvements in construction by an arrangement of a lever and toggle connected with a beater or follower operated directly by a lever and toggle connected with a beater or follower operated directly by means of ropes and capsitan, with horse-power.

**MATHEMATICAL INSTRUMENT.**—William Rutherford, Athens, Ga.—This invention relates to an improved mathematical instrument for the use of civil engineers, surveyors, navigators, architects, and draftsmen generally, in plotting a survey from field notes, the traverse or rhumb line of sailing vessels, laying down plans of buildings, etc., with great facility and accuracy.

**TOY ENGINE.**—James L. Warner, New York City.—This invention consists in the application of a glass boiler, which is provided at the top with one or more tubular iron jointed arms. The said boiler is suspended from a wire or other rope, in which a swivel is arranged, to allow the boiler to revolve. The boiler is filled with liquid, of any desired description, and is suspended above a lamp so that steam is generated in it. The steam escaping through the curved tubular arm, rotates the boiler by reaction.

**ELEVATOR.**—Joshua Walker, Kansas City, Mo.—This invention relates to a new and improved device for elevating articles, and is more especially designed for loading the tenders of locomotives with wood or coal, although it is applicable to other purposes. The object of the invention is to economize labor and facilitate the loading of boats, locomotive tenders, etc., etc.

**SASH FRAME.**—J. E. Cowdery, Wheatland, Iowa.—This invention relates to an improvement in sash frames, and consists in an L or tongue-shaped lip attached by its long arm to the meeting rail of each sash, so that the tongue of each will enter the groove of the other when the window is closed.

**MINERAL PAINT.**—J. H. Smith, Keyport, N. J.—The object of this invention is to make a composition wash, when used as a paint, shall form a water and fire-proof paint.

**CARRIAGE WHEELS.**—Reuben Brooks, Rockport, Mass.—This invention relates to a new and improved method of joining the felloes of carriage wheels whereby the wheel is rendered much more durable than it is when the felloes are joined in the ordinary way, and it consists in providing a metallic clamp for the support of the joint at the end of the spoke.

**STOVE.**—C. H. Roberts, Troy, N. Y.—This invention consists in applying wood to the knobs of stove doors, whereby the doors may be handled without danger of burning the fingers.

**SEEDING MACHINE.**—B. A. Shearer, Crown Point Center, N. Y.—This invention relates to a new and improved machine for sewing seed broadcast, and it consists of a revolving grooved cylinder arranged or applied in a novel way and using in connection with the same a series of harrow or covering teeth, all being applied to a frame mounted on wheels and provided with a seed hopper.

**KEYS FOR BOLTS.**—Nathan Adams, Atchison, Kans.—This invention relates to a machine for making split or spring keys for securing bolts, and it consists in the use of dies and levers whereby the bar from which the key is to be made is cut, bent into the required shape, and then dropped, the whole operation requiring but two moves of a lever, the whole machine being very small and compact.

**ADJUSTABLE HOLLOW FRAME FOR ELEVATOR PLATFORM.**—R. M. Van Sickler, New York.—This invention has for its object to furnish an improved attachment to an improved elevator, patented by the same inventor Feb. 12, 1867, so as to make it more convenient and efficient in use, and which may at the same time be used with other elevator platforms with equal facility and advantage.

**JAWS FOR BENCH VISES, ETC.**—Nathaniel Wilton, Groton, N. H.—This invention has for its object to improve the construction of the jaws of the bench vise, bench vises, etc., so that they may be able to hold the work firmly whether it be straight or tapering.

**HAY RAKE AND LOADER.**—Archibald Campbell, Peoria, Ill.—This invention has for its object to furnish an improved machine for attachment to hay wagons by means of which the hay may be raked and elevated upon the wagon rapidly, conveniently, and without requiring extra help.

**GRAIN AND MEAL DRYER.**—John R. Everison, Mount Vernon, Ind.—This invention has for its object to improve the construction of the improved grain dryer patented by the same inventor Nov. 27, 1866, and numbered 59,299, so as to make it more effective in operation, and so that the same effect may be produced with a smaller amount of fuel.

**HORSE-POWER.**—Zachariah Tobias, Covington, Ohio.—This invention has for its object to furnish an improved horse-power, so constructed and arranged that the labor of loading the horse-power upon and unloading it from a wagon every time it is transported from one place to another may not be necessary.

**Answers to Correspondents.**

**CORRESPONDENTS** who expect to receive answers to their letters must, in all cases, sign their names. We have a right to know those who seek information from us; besides, as sometimes happens, we may prefer to address the correspondent by mail.

**SPECIAL NOTE.**—This column is designed for the general interest and instruction of our readers, not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries, however, when paid for as advertisements at 50 cents a line, under the head of "Business and Personal."

**All references to back numbers should be by volume and page.**

**P. W. S. of Mass.**—The so-called granite of Quincy, Mass., is really sienite, and as a building material is preferable to real granite, the mica in the latter tending to contribute to its disintegration. Sienite—that quarried at Quincy—is composed of felspar, quartz, and hornblende. **G. D. G. of N. Y.**, says: "A friend of mine is trying to make a marketable hard soap from the following recipe: 5 bars B. T. Babbitt's German Krässle Soap; 5 quarts of water; three ounces of borax, and 1 ounce spirits of ammonia. But his product is too soft and shrinks badly. He asks how it can be made harder and less shrinkable." We reply: use one quart instead of five quarts of water to get a harder product, and keep the soap in a damp cellar to prevent shrinking. But the proposed improvement on the original Babbitt soap will not pay for the trouble. The recipe is probably a catchpenny imposition.

**A. G. of Fla.**, says: "I see in your issue of Oct. 5th, page 210, that J. H. S. of Ohio, asks how he can harden steel plows without springing. This is my recipe: Chalk the share thoroughly, then heat it a

cherry red and lower it slowly into a tank or barrel of rain water—in an upright position—and it will not spring."

**C. D. of Mass.**, asks us to tell him how to find the horsepower of a steam engine. We have replied to this question at least six times in as many months through this column. If C. D. will examine back numbers of this paper—which we have not time to do—or read Bourne's Hand Book of the Steam Engine he will procure the knowledge for himself, and it will be all the more valuable to him for the labor expended.

**J. D. P. of Pa.**—The tin foil used in putting up tobacco is now made of lead and tin. The exact process we do not understand, but believe it is similar to the manufacture of gold wire, a bar of lead being coated with tin and then rolled to the requisite tenacity.

**C. H. of Conn.**—The note you refer to concerning the employment of a cane held above the head as a protector from rain in lieu of an umbrella, if published in these columns, was probably noticed as a popular humbug. We are not aware of such an invention, and cannot except the explanation you propose.

**A. M. A. of N. Y.**—Enamel colors used by jewellers are metallic oxides incorporated with a fusible flux such as borax, flint, oxide of lead, etc. The jeweller labors under considerable difficulty during the process of application, for the tints on the palette in most cases differ from those they assume after being heated sufficiently to cause the color to become fixed to the ware. If "over fired" or "short fired" the color is destroyed beyond remedy in one case, or assumes one of the intermediate variety of shades, in the other; the definite hue which alone gives the color a perfect hue, is only recognized after long practice.

**J. B. of O.**, is referred to the corresponding column on page 87, current volume, for cements for water joints.

**A. J. of Md.**—Needles made of steel, and called at first Spanish needles, were introduced in the reign of Queen Elizabeth, but by whom invented, history fails to tell. Pins, such as we now use, seem to have been unknown in England until about the middle of the fifteenth century. Previously, substitutes were employed made of box wood, ivory, bone, and a few of silver, all being necessarily of such large size that brooches and hooks and eyes were much employed in preference for holding together the parts of the dress.

**L. F. S. of N. Y.**—The latest explanation for the autumnal change of leaves with which we are acquainted is that of M. Carey Lea, of Philadelphia. He considers light to be the primary cause, the tendency always being to produce photographic colors. While the leaf retains its full vitality this influence is successfully resisted, but in autumn the leaf gradually loses its hold upon the branch, and the action of light predominates producing the change. These views we previously published on page 181, Vol. XV.

**P. D. of Canada.**—Hollow water grate bars are very old.

**C. R. W. of Pa.**, asks for a thermometer to ascertain the temperature of molten iron. Above the boiling point of mercury heat is measured by its effect upon solids. Wedgwood's pyrometer is the oldest instrument of this kind, and is founded upon the contraction of clay at high temperatures. Daniell's pyrometer is more exact, depending upon the expansion of a platinum bar encased in a sheath of black lead. A line under our "Business and Personal" column would bring you the address of manufacturers of these instruments which we are unable to furnish.

**S. G. of N. Y.**, asks what is the greatest number of times that any piece to be brought to the shoulder can be fired in a minute, how it is constructed, what kind of a charge is used, and if it has more than one trigger. We refer our correspondent to the Ordnance Board of the War Department. We have seen a Sharp's rifle brought to the shoulder and fired twenty-one times in a minute. Its construction must be familiar to all interested in these matters. Other pieces, we are informed, excel this in rapidity.

**P. C. of Me.**—Your article on the combustion of fuel is anticipated by a similar one in this issue of the SCIENTIFIC AMERICAN. Your facts have been so often reiterated that it hardly seems necessary now to reproduce them. We reserve the article for possible future use.

**W. C. of Ohio** informs us that he has sent a communication on boiler setting which has not been published and asks what he shall do to obtain a hearing. In reply we would say that we wish for facts not surmises, and want them boiled down to their essence. "This rule," as the military men say, "is general."

**T. I. of England.**—proposes, for a light water power, building a tank in which is an upright pipe, bent as a syphon, the longer limb descending outside, below the reservoir, with some means of exhaust to induce the flow of water which will be discharged on a wheel. But he wishes to return the water back and asks how it is to be done. He inquires also how he can obtain some of the ingenious American tools he sees noticed in the SCIENTIFIC AMERICAN and refers to an improved gimlet and a back saw, as examples. If he will refer to No. 17, current Vol., he will find the leading editorial contains some information on his first inquiry, and in our issue of July 13th, page 25, and that of July 20th, page 37, he will understand about the back saw and gimlet. Any responsible dealer in tools and machinery can furnish him with American improved tools. Probably advertisers in the SCIENTIFIC AMERICAN will notice this call from across the water.

**H. H. of Wis.**, sends us a carefully prepared paper on mechanical power which we have read and the statements of which we have considered. If they are valuable they are too verbose, and as they contradict the experience of years and the observations of scientists we decline to publish them in the form presented. Our correspondent smears at science as having "for ages believed in false theories." Let him present the opposing facts and we will welcome them.

## Business and Personal.

The charge for insertion under this head is 50 cents a line.

**Inventors and Manufacturers of Labor-saving Machinery.**—Articles useful in the Household, the Workshop, or on the Farm, will find it to their interest to send circulars to, or correspond with, "The Texas Labor-Saving Machinery Agency," P. O. Box 244, Houston, Texas.

**Mr. N. E. Blake,** who obtained a Patent for a Roofing Composition, will please address R. C. Graves, Barnesville, Ohio.

**Sewing-Machine Cabinet-Case Manufacturers or Patentees,** and Manufacturers of Sewing-Machine Oilers, please publish your address in this paper.

**Wanted—Address of Manufacturers of Bullets and Cartridges,** C. H. Remington, Dubuque, Iowa.

**A Young Man,</b**

**Improved Brick Molding Machine.**

The simplicity of the machine represented in the engraving renders any detailed description unnecessary. The inventor says in brief: "The nature of my invention consists first, in the flat, square, or triangular bar for pulverizing the clay; then the mode of stepping the shaft within the clay box, that is to say the projecting hub on the bed plate with its wooden conical seat in combination with the cavity in the stem of the screw, by means of which the surrounding clay is excluded from the step to prevent the wear, and the screw is brought down near the bed plate to wipe as closely as possible without contact. Thus the throat of the screw gathers within itself a charge of clay which cannot escape except through the openings of the bed plates into the molds beneath. The open portable mold frame with a projecting flange, the mold resting on a single detached plate for a bottom, so that when the mold is thrown on the floor the brick does not come at the same time in contact with the ground because the flanges prevent this result; but the concussion is just sufficient to start the brick when it slips easily from the mold."

The cavity in the center of the screw or sweeping blade incloses the step of the shaft and allows the blade to come clear to the bottom of the mill. The molds are carried from the mill by the rocking bars seen in the engraving driven by the cranks at the top of the machine. It will be noticed that the grinding machinery is geared down so that the expenditure of power will be much less than in some less heavily geared machines. The clay is taken direct from the bank and passed through a pulverizer which reduces it to dust and frees it from stones and other foreign matters. Water is then thrown upon it and it remains in soak all night. This part of the operation is of great importance at the South, as it has all the effect of winter digging. By steam or water power this machine is claimed to produce three thousand bricks per hour, while the labor of one horse will yield eight hundred.

It is the subject of two patents granted to Francis H. Smith, who may be addressed relative thereto, Box 556, Baltimore, Md.

**Science Familiarly Illustrated.****The Gordius or Hair Worm.**

Every one who has lived in the vicinity of ponds or streams, must often have seen in the water a worm or snake resembling in appearance a coarse human hair. To the unaided eye the resemblance is perfect, with the exception of motion. It is a common notion that these worms were originally hairs, and that the transformation has been effected in some mysterious way by the action of the water. When a boy, we have frequently dipped them up in buckets, and watched their motions for hours. They are from seven to thirty inches long, and are frequently found in the bodies of beetles, and in moist earth, as well as in the water. Sometimes they are found floating, snarled into a knot or curl, and enveloping a little white mass. This mass contains its eggs, which are agglutinated together, and number millions. When seen on the surface of the earth in dry weather, they are brittle, and if handled will break like a dry twig. A rain, however, or heavy dew, will restore their suppleness. A writer in one of our exchanges thus details his observations made on one of these worms:

"When I first received it, it was coiled up in a close roll at the bottom of the bottle, filled with fresh water that contained it, and looked more like a little tangle of black sewing-silk than anything else. Wishing to unwind it, that I might examine its entire length, I placed it in a large china basin filled with water, and proceeded very gently to disentangle its coils, when I perceived that the animal had twisted itself around a bundle of its eggs, holding them fast in a close embrace. In the process of unwinding, the eggs dropped away and floated to a little distance.

"Having finally stretched it out to its full length, perhaps half a yard, I sat watching to see if this singular being, that looked like a long black thread in the water, would give any signs of life. Almost immediately it moved toward the bundle of eggs, and, having reached it, began to sew itself through and through the little white mass, passing one end of its body through it, and then returning to make another stitch, as it were, till the eggs were at last completely entangled again in an intricate net-work of coils. It seemed to me almost impossible that this care of offspring could be the result of any instinct of affection in a creature of so low an organization, and I again separated it from the eggs and placed them at a great distance, when the same action was repeated.

"On trying the experiment a third time, the bundle of eggs had become loosened, and a few of them dropped off singly into the water. The efforts which the animal then

made to recover the missing ones, winding itself round and round them, but failing to bring them into the fold with the rest, because they were too small, and evaded all efforts to secure them, when once parted from the first little compact mass, convinced me that there was a definite purpose in his attempts, and that even a being so low in the scale of animal existence has some dim consciousness of a relation to its offspring. I afterward unwound also the mass of eggs, which, when coiled up as I first saw it, made a roll of white substance about the size of a coffee-bean, and found that it consisted of a string of eggs, measuring more than twelve feet in length, the eggs being held by a gelatinous substance that cemented them and prevented them from falling apart. Cut-

crooked or S-wrench and some other forms designed for special occasions. Such is the object of this improvement.

The jaws of the wrench are arranged in a similar manner to those on the common screw wrench, the movable jaw, A, being advanced to or receded from the fixed jaw, B, by a nut which engages with the segmental thread cut on the shank, C. This shank is firmly secured to a semi-circular disk, D, which turns on a pivot or screw passing through the arms, E, by which means the jaws may be rotated around half a circle. The periphery of this disk has a number of notches into which fits a spring pawl, F, which is receded from contact with them by a knob, G, to be operated by the thumb or finger. In the engraving a portion of one of the arms is broken

away to show the pawl. From this description the action of the wrench can be easily understood. The jaws may be secured in any position between the two opposite points of a half circle so as to be adapted to the situation of the nut to be turned. Thus the wrench may be used as an ordinary screw wrench, a hook wrench, a straight wrench, or a curved wrench, while the jaws may be set to accommodate any size of nut. Machinists and others who require wrenches will see the advantages of this device.

Patented August 1, 1865 by James White, Cleveland, Ohio. The patent is for sale. Application should be made, personally or by letter to J. H. Beardsley, 119 Nassau street, New York city, or to the inventor, Cleveland, Ohio.

**Novel Application of Electro-Magnetism.**

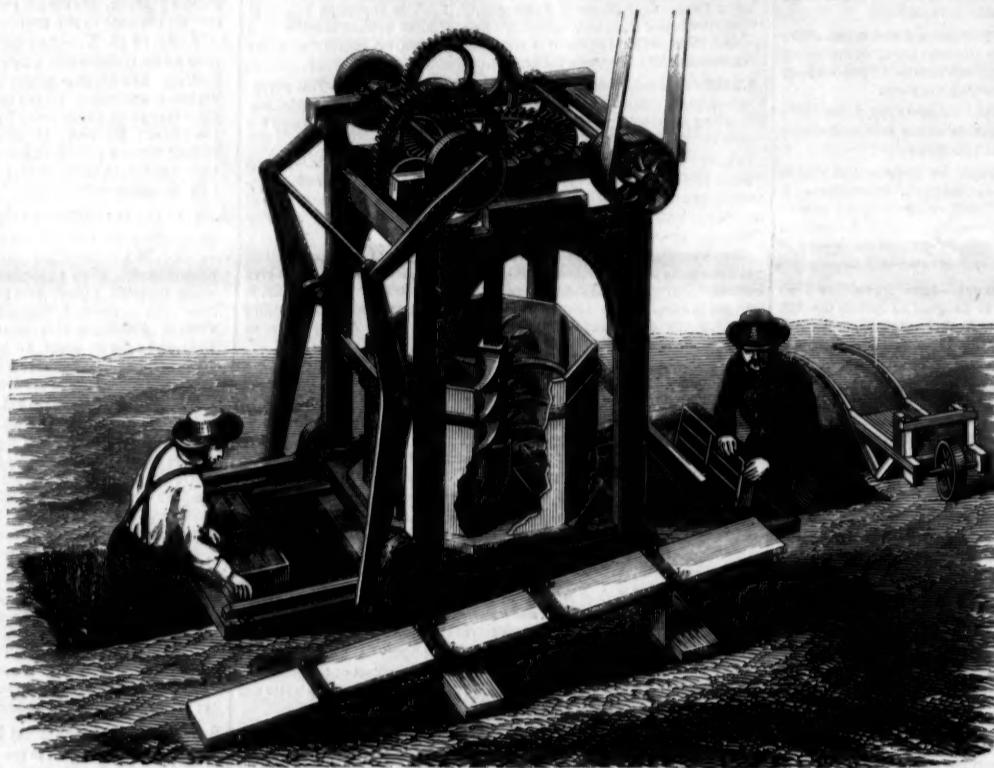
The last number of the *Cosmos* contains an article of considerable interest of the various applications of electro-magnetism by Prof. Glaesener, of the University of Liège, in Belgium. Among them there is a Chronograph for the measure-

ment of very minute particles of time, and which deserves some description as regards its application to artillery. Suppose it be required to measure the velocity of a cannon ball. For this purpose let a series of targets, consisting of hoops intersected by wires, be placed at given distances. The wires of each hoop communicate with a separate electro-magnetic apparatus, by which an iron pencil-holder is kept in an unvarying position by attraction so long as the circuit is not interrupted. Opposite and close to this pencil-holder there is a cylinder turning on its axis at the rate of four revolutions in a second. Its surface, which is covered with paper, is divided into 500 parts by lines drawn parallel to its axis, so that each part represents one two-thousandth of a second. Its motion is effected by clockwork. Now, whenever the electric current is interrupted the pencil-holder ceases to be attracted and falls on the surface of the cylinder, on which its pencil, therefore, describes a line. Whenever the circuit is completed the pencil-holder is re-attracted and leaves the paper. Let us now suppose a cannon ball to be fired through all these targets, so placed, of course, as to lie in the path of the curve described by the missile. Each time it passes through one of the hoops it snaps asunder one of the wires: the circuit is consequently interrupted, the pencil-holder falls and marks the precise time of the passage. And so on, from target to target, each of which, as we have said, is connected with a separate apparatus. In this way both the space and the time employed in going over it being determined, the velocity, which is the ratio of time to space, is determined also to a fraction of one two-thousandth of a second.

**The Brazilian Pebble—Natural Glass.**

J. W. R. B., and A. G. A., of Ill., have a dispute they wish us to settle. It is whether "the so-called pebble spectacles are stone, or a superior glass made from a peculiar stone. Are there stones large and clear enough to be ground to make spectacle lenses?" We do not care to act as arbiters in disputes, but will furnish the information desired. The lenses are made from a rock or quartz crystal, which may be considered a natural glass. The Brazilian pebble is highly esteemed because it is harder than glass and not so liable to be scratched. It has a lower dispersive power than other pebbles and than many glass lenses. A splendid specimen, spherical and perhaps three inches diameter, is to be seen in a jewelry store in Brooklyn.

**PICKWICKIAN ANTIQUARIANS.**—An exchange asserts that the Minnesota Historical Society, in their late excursion to Lake Minnetonka, to investigate the remains of the "ancient mound builders"—a race dwelling in this country long before the arrival of the Indians—were successful in finding several human bones, which after a labored discussion proved to be the broken limbs of trees. A supposed skull elicited great attention from its remarkable phrenological development, but a rustic demonstrated to the learned gentlemen that the supposed cranium was in truth a mud-turtle's shell. Several mounds, it is stated, have been prepared and supplied with bones and pieces of broken crockery, for the future investigation of this society.

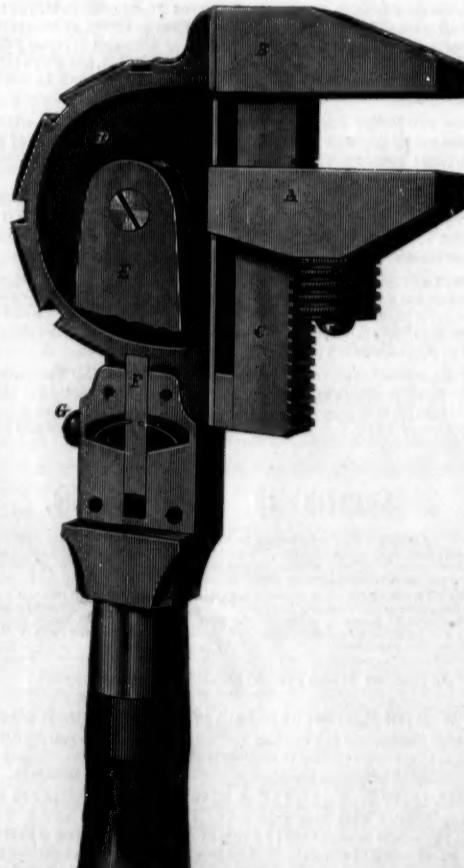


SMITH'S BRICK MOLDING MACHINE.

tting this string across, and placing a small section under the microscope, I counted on one surface of such a cut from seventy to seventy-five eggs; and estimating the entire number of eggs according to the number contained on such a surface, I found that there were not less than eight million eggs in the whole string.

**WHITE'S IMPROVED MONKEY WRENCH.**

The ordinary monkey or screw wrench is one of the most useful tools in the machine shop, factory, mill, stable, or on



the farm. It can be so readily adapted to all sizes of nuts, and to hexagonal as well as square heads and nuts, that no other single implement will subserve so many useful purposes. The ratchet wrench is slow of action and is not capable of so many adaptations; and it would be desirable if the screw wrench could be made to serve the purpose of the



their engine lathes with slate's patent taper attachment, which was illustrated on page 124 No. 8, Vol. XVI, SCIENTIFIC AMERICAN. The lathe at the Fair is sold to the Swedish Government, for which and the Austrian government the firm has done a large amount of work. Being in New York on its way to its destination it was detained for a time for exhibition. Like all their tools, this shows the perfection of finish and accuracy. For boring tapering holes, as well as turning tapers, machinists will acknowledge it to be a valuable tool.

J. A. Fay & Co., of Cincinnati, Ohio, show a fine collection of wood-working machinery. An observable merit in their machinery is its excellent proportions of material, together with good workmanship.

In saws, R. Hoe & Co., and the American Saw Company both of New York city, make fine displays. W. P. Miller, also, of San Francisco, Cal., has a specimen of his adjustable teeth in a large circular saw. Both of these latter have been illustrated in these pages. This department of the exhibition proves that very great attention is now being paid to the perfecting of tools in their details.

The brick machine of D. W. Seeley of Albany, N. Y., illustrated in the SCIENTIFIC AMERICAN page 279, No. 18, Vol. XV., is at work turning out bricks from the raw clay brought in barrels, without the straw, the want of which seemed to be the great annoyance to the Israelitish slaves in Egypt. The rapidity of its operation and the perfection of its products are sufficient recommendations of its utility and general advantages.

One of the curiosities in the exhibition is the machine for putting up tobacco in papers—tin foil. Its operation is a marvel until investigated. The parts exposed to view are few and apparently simple, but like the automaton chess player of Maelzel, the machinery that gives them life is concealed in a box. The tobacco being placed in a sort of hopper, a piece of tin foil and a corresponding piece of paper is placed on a platform when, by the turn of the crank, the envelope is folded into shape, the tobacco forced in, and the paper filled ready for sale and delivery. It can be operated either by hand or power.

We regret that the agricultural department in the south gallery is without attendants, and that the machines are not in many cases furnished either with cards containing names of the exhibitors, or circulars giving any description of operation. Among the agricultural machines are several which seem worthy of notice, but not being furnished with the claims of their exhibitors and no space being allowed for their thorough examination, we are obliged to pass this department by without further notice.

Mr. Linnell, who was so cruelly mutilated by falling into the engine he was driving died on the 18th of October. Mr. McGowan, who lost his right hand under the Merrill hammer is doing well. Being a practical mechanic, depending upon his daily work for his daily support, his case is a hard one. Both these men have, or had, dependent families, and it seems as though the Association ought to donate the proceeds of one day's exhibition to their benefit. If the Board of Managers cannot afford that, let the exhibition be extended one day for this purpose, and a notification to that effect would bring out hundreds, who would not otherwise visit the exhibition.

#### DEPARTMENT OF THE DWELLING.

Before concluding our notice of this section, there are a few articles of merit yet to notice. The remontoir tower clock, manufactured by G. M. Stevens & Co., of Boston, hourly, at least, attracts general public attention. This clock is claimed to be the most reliable and best timekeeper ever introduced. The escapement is a remontoir action and produces an impulse upon the pendulum which is exactly alike during each and every minute. The agents for this city, Benedict Brothers, also exhibit four regulator clocks with compensating pendulums.

In the cutlery department, Clement Hawkes & Maynard have a fine case of ivory and pearl-handle knives. Two cards of pocket knives, artistically arranged, ranging from the most delicate of penknives to the homelier but more serviceable jackknife, and comprehending over three hundred different styles, are samples of the manufactures of D. F. Smith & Co., of Bronxville, N. Y. A bale of brown cordage in an uncoiled place, is labelled as specimens of rope made from California vegetable hair, but further information relative to this real curiosity, beyond this simple statement, is unfortunately not forthcoming. Near this bale the Union Fence Company have erected one of their combination fences, which, though made of wood, has all the appearance of stone with the strength of iron. The work on these is all done by machinery, the several parts are snugly fitted, and are driven together with lead and oil, while the neatness, strength and asserted cheapness make this one of the best fences in use.

For a simple article of domestic utility, the combined dustpan and broom of Clough & Bryant commends itself to favorable notice. The handle of the pan is made hollow and through it slides the broom handle, thus giving to this badge of the tidy housewife a neat and compact form. Equally convenient is Richmond's rubber rack for holding brooms, brushes, cans, and whips. The arrangement consists simply of a disk of india-rubber having slits perforated in it, so that the handle is grasped and firmly held in its upright position.

There is an imposing display of glass and silver-plated ware exhibited by house-furnishing establishments of the city, but we have not the further space to devote to this department.

#### DEPARTMENT OF DRESS AND HANDICRAFT.

Although this is one of the most attractive of the seven grand divisions, under which the managers of the Fair chose

to classify the articles offered for exhibition, yet from the nature of the department our report must be somewhat brief and cursory. We might go into ecstasies over the really beautiful specimens of wax flowers and autumnal leaves, which so perfectly mirror nature as to cause a constant succession of rapturous superlatives to flow from the lips of enraptured beholders—but we forbear. Space might be filled by an enumeration of the articles of female adornment displayed in attractive show cases, but such description would hardly fall within the scope of these columns; and, for a like reason, although the subject might not prove so incomprehensible, we must omit any elaborate notice of goods of gentlemen's wear. Rolls of cloth are there, woolen, cotton and silk, the comparative merits of which must be discussed by the awarding committee only. Of sewing and knitting machines, we have already noticed the more important.

To the non-professional eye, the imposing array of artificial teeth daintily mounted upon velvet cushions, is somewhat appalling, while the cases of dental instruments are to most observers, too suggestive of past or prospective torture to be attractive. There are about three hundred practicing dentists in this city, and although all are not exhibitors here, the profession does not lack for representatives, most of whom claim for their wares points of superiority, which, however, are not peculiarly striking to the general nor even the reporter's eye. We notice that several exhibitors have adopted an impressive method of proving to the world their claims as benefactors of the race, by conspicuously posting duplicate photographs of the same personage: one with sunken cheek and general antique expression, while the other picture, representing the individual provided with a set of the exhibitor's patent improved dentures, would have been accepted by old Ponce de Leon—unacquainted alike with either dentists or photographers—as conclusive evidence of the existence of his long sought rejuvenating spring.

Though thus unceremoniously dismissing this Department, there are several novelties which are worth referring to. The Bangs Williams' News Company, of Providence, exhibit a large and varied assortment of rich fancy boxes for holding handkerchiefs, gloves and jewels, which, although pronounced by most observers French goods, are made in Providence, and are now brought before the public for the first time. The American Kaleidoscope Company have made a decided improvement on this optical toy, and given it something more of importance than it hitherto possessed. As previously constructed, only transparent objects could be shown in it, but by admitting the light so as to be reflected to the eye, opaque objects, such as flowers, insects, and stones, as well as transparent ones, may be used, and being elegantly constructed, the improved kaleidoscope is destined to become very popular.

There are several exhibitors of bronze goods, among which we may note the small fancy bronzes and carte-de-visite mountings of P. Mignot, and the bronze clocks and gas fixtures of the Tucker Manufacturing Company.

Under the second grouping there is a case of vulcanite cravats and bows, by the New York Hard-rubber Collar Manufacturing Co. These and Morris's scarf and tie-holders—the latter a neat frame or plate whereon can be formed a scarf or tie, without sewing—are conveniences whose virtues are at once apparent to the masculine mind.

The American Fishhook and Needle Company, of New Haven, have a case of hooks of different sizes made entirely by machinery at the rate of two hundred a minute. This company is the pioneer in this manufacture, hitherto all hooks having been made by long and tedious hand processes.

#### FINE ARTS.

Prang's chromos are almost, if not quite as natural as water colors or oil paintings. Chromo-lithography is the art of painting pictures from stone in colors. The most difficult branch of it—which is now generally implied when chromos are spoken of—is the art of reproducing oil paintings. When a chromo is made by a competent hand it presents an exact counterpart of the original painting with the delicate gradations of tints and shades, and with much of the spirit and tone of a production of the brush and pallet. The impressions from the stone are taken on thick white paper which passes through a heavy press before being used. Among the most beautiful, to our eyes, were Nos. 8 and 10—scenes from the White Mountains, and late autumn in the same beautiful region—from an oil painting by A. T. Bricher. Prang, of Boston, has carried this art to greater perfection than any other publisher in this country.

Hanging low and almost out of sight, we notice a small picture by Clinton Lovelidge, of Brooklyn, N. Y., "Forest Winter Scene." Woodland scenes are ever impressive, and in the mystery of its voices lies much of the fascination of the forest, but the effect of stillness which this scene conveys is almost painful in its intensity. A path on which the snow lies white and untrodden, opens directly through the woods without curve or break to divert the eye, and on either side the gray stems of the trees stand gaunt and weird like grim sentinels. E. H. Nichols, Esq., has a large painting "Scene on the White Mountains," the foreground is particularly good, and the rocks are very true to nature. The U. S. Machinery Carving Co., corner of Second avenue and 23d street, exhibit machine carving on wood and marble. There are many specimens of this carving, and those on wood are much superior to the efforts on marble. Among the latter are some alto and basso-relievo, and some bordering in intaglio; but there is not distinctness and clearness enough of outline: they have the smooth effect of casting, and we miss the sharply defined yet delicate and firm mark of the chisel. But for ornamentation in wood and all decorations of that kind, for cabinetware picture frames, and the numerous uses to which woods of different kinds are put—it is an adaptation of

machinery of great value. The pattern or device once made, any number of duplicates can be carved directly from the block of wood, and the pattern can be placed at any desired angle, thus producing different effects from one pattern.

James Prentiss, optician, 164 Broadway, New York, shows a handsome case of mathematical and drafting instruments, and the Willard Manufacturing Co., 684 Broadway, a collection of camera tubes and lenses. Both of these collections are worthy notice.

#### The Musketo Pest.

The cool weather we are now enjoying has not yet rid us of the pest of the musketo; any suggestion therefore for defending ourselves from their attacks will be welcome. The Philadelphia Ledger says:

"Of the various remedies proposed, none are so efficacious as the use of musketo netting in the windows and around the beds at night. But as this is not always practicable or convenient, we must resort to other means for bidding defiance to our enemies. Of these, the best is the smoke produced by burning a small quantity of what is technically called, "Persian Insect Powder." This consists of the powdered flowers, and perhaps young stems and leaves, of a plant known to botanists as *Pyrethrum caucasicum*, a kind of chamomile cultivated largely in Germany, resembling the common garden chamomile in many of its properties, and of which all the various "insect," "magnetic" and "fly" powders are wholly or entirely composed. For use against musketoes, a small quantity—about what could be heaped upon an old-fashioned silver dollar, if any of our readers remember the size of that coin—is placed at bed time on a plate, and the top of the heap touched with a lighted match until it shows a red coal. The mass will then smoulder gradually away, filling the room with a light smoke, which narcotizes the musketoes and keeps them quiet for several hours, after which it may be necessary to repeat the operation. The evolution of the smoke will be facilitated by stirring the burning powder from time to time, so as to secure perfect combustion, although this is not absolutely essential. The powder may be also twisted up in a light cylinder of paper, and burnt in that form. Its use, as described, against musketoes, gnats, etc., has long been known to the Chinese and Tartars, who mold it into sticks and burn in their tents and dwellings, which would in many cases be uninhabitable without it. The same substance, in its powdered state, is also used to great advantage in preventing the attacks of roaches, bedbugs, fleas, ants, etc., and in keeping flies off the dining tables. It is perfectly harmless to mankind, and may be eaten as freely as chamomile, and the smoke is not at all injurious. This latter, it may be mentioned in addition, has much the same effect on flies as on musketoes—not destroying them, but merely throwing them into a stupor."

"Carbolic acid, poured upon a rag and hung near the bed at night, also acts very favorably, by its powerful odor, in keeping away musketoes. This is, however, more disagreeable to most persons than the smell of the burning insect powder, which resembles that from a mild cigar."

#### OFFICIAL REPORT OF PATENTS AND CLAIMS

Issued by the United States Patent Office,

FOR THE WEEK ENDING OCTOBER 15, 1867.

Reported Officially for the Scientific American

PATENTS ARE GRANTED FOR SEVENTEEN YEARS the following being a schedule of fees:

On filing each Case.....	\$10
On filing each application for a Patent, except for a design.....	\$15
On appeal to Commissioner of Patents.....	\$20
On application for Release.....	\$20
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On filing a Disclaimer.....	\$20
On filing an application for Design (three and a half years).....	\$10
On filing application for Design (seven years).....	\$15
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In addition to which there are some small revenue-stamp taxes. Residents of Canada and Nova Scotia pay \$500 on application.

Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required, and much other information to Inventors, may be had gratis by addressing MUNN & CO., Publishers of the Scientific American, New York.

69,739.—CORN PLANTER.—Geo. Abbott, White's Corners, N.Y.

1st. I claim the catch, L and spring rod, K, in combination and arrangement with the gearing and planting apparatus of a corn planting machine, for the purposes and substantially as described.

2d. The planting leg, G, connected with the driving wheel by means of appropriate gearing, in such manner that the leg may be caused to move up by the mechanism, and let fall by its own gravity and plant hills at intervals, substantially as described.

3d. The seed gatherer, H, arranged with the seed box, O, partition, O', and tube, R, for the purpose of picking up and carrying the requisite number of kernels to form a hill and depositing the same in the planting leg, G, substantially as described.

4th. The valve, L, placed at the foot of the planting leg and operated by means of the rod, V, lever, v, and cam, F1, for the purpose and substantially as described.

5th. The spring rod, K, operating upon the Dutch wheel, I, to advance or set back the planting gear, substantially as set forth.

6th. The hill marker or projection, N, near the foot of the planting leg, G, by which each hill is individually marked, substantially as set forth.

7th. The shield, P, placed in the seed box around the feed slide, for the purpose and substantially as described.

8th. The cam wheel, F, by which a planting leg and marker and a seed gatherer, either or all, may be operated, for the purpose and substantially as described.

9th. The vertical slide or seed carrier, H, arranged with the seed box, O, partition, O', and tube, R, and operated by the cam, F2, for the purposes and substantially as set forth.

10th. The slotted swivel joint, T, as a means of connecting the pendant, T, to the overhanging bar, F, for the purpose and substantially as described.

69,740.—MACHINE FOR MAKING KEYS FOR BOLTS.—Nathan Adams, Altoona, Pa.

1st. I claim the device for cutting the bar, consisting of the cam, n, on the lever, F, die, B, and cutter, H, all made and operating substantially as herein shown and described.

2d. The combination of the gauge, h, with the cutter, H, die, B, and cam, n on the lever, F, die, B, and cutter, H, substantially as set forth.

2d. The spring, K, provided with the pin, i, and cam, y, in combination with the bar, D, substantially as described for the purpose specified.

4th. The construction and arrangement of the slotted plate, A, pivoted dies, B, C, arms, e c, pivoted bar, D, slotted rod, E, lever, F, having cam, n, cutter, H, stationary bridge, G, gage, h, spring, K, having cam, y, and pin, i, all operating as described for the purpose specified.

69,741.—RAILROAD SWITCH.—Sidney Allen, Newton, and Jas. P. Snow, Roxbury, Mass.

1st. I claim the suspended pivoted guide shoe or shoes, F, constructed as described and arranged to be adjusted between the wheel, D, and the raised tangs, E, upon the elevated track, whereby said wheel is crowded off the

raised track upon the branch track, as herein set forth for the purpose specified.

3d. The combination of the weighted or drop levers, H, with the suspended shod and frame of the car, substantially as herein shown and described and for the purpose set forth.

3d. The combination of the operating levers, J, with the weighted levers, H, and with the frame, E, of the car, substantially as herein shown and described and for the purpose set forth.

4th. The raised and flanged guide block, K, constructed as described, connected with the rails of the track at the point where the branch track leaves the main track, substantially as herein shown and described and for the purpose set forth.

The combination of the guide block, L, with the rails of the track at the point where the branch track leaves the main track, when used in connection with the depressed rail and deepened track, substantially as herein shown and described and for the purpose set forth.

**69,742.—ARTIFICIAL LEATHER FOR FLOOR COVERINGS.**—Stephen M. Allen, Woburn, Mass.

1st. I claim the sheets made by combining pulped or ground tanned leather scraps with vegetable fiber, and pulped untanned animal skins, to be used in the manufacture of floor coverings or carpets, substantially as before described.

2d. Sheets made by combining pulped or ground tanned and untanned animal fiber or scraps of skins with vegetable fiber, further combined with hair, skin, or organic fiber, and pulped into sheets, substantially as before described and for the purposes specified.

3d. I claim the stuffing, painting, staining, or printing, in the manner and for the purposes specified, sheets made by combining tanned scrap leather and vegetable fiber with untanned scraps of hides, or with the further combination of bullock's blood or sheepskin, manufactured substantially in the manner and for the purposes set forth.

4th. As a new article of manufacture, a floor covering or carpet made by combining a coat of starch, wax, and vegetable fiber combined with un-tanned scraps of hides, or with the further combination of bullock's blood or sheepskin, the whole manufactured substantially as herein set forth.

**69,743.—CULTIVATOR.**—A. H. Allison, Charlottesville, Ind.

1st. I claim the axles, d, in combination with the tie, C, C, when constructed and arranged as and for the purpose herein set forth.

2d. The beams, D D, the blocks, H H, the rod, m, the rods, g, g, and the disks, h, the whole constructed and operating substantially as herein specified.

**69,744.—SAW MILL.**—Leonard Anderson, Painesville, Ohio.

1st. I claim, 1st, The combination in the frame, A', of the vertical sideways, C', and diagonal tongue, G G', operating substantially as and for the purpose herein specified.

2d. The vertical sideways, C', when used to guide and carry the head of the saw, and at the same time to carry or support the jaws of the saw guides, N, substantially as and for the purpose herein set forth.

**69,745.—SAFETY VALVE FOR OIL STILLS.**—Samuel Andrews, Cleveland, Ohio.

I claim the herein described safety valve constructed and applied to oil stills, substantially in the manner as and for the purpose set forth.

**69,746.—WINDOW SASH FASTENER.**—H. G. Arnolds, Rochester, N. Y.

I claim a sash lock composed of bolts, H, tumbler, G, and notched plate, arranged as and for the purposes set forth.

**69,747.—PISTON PACKING.**—Mifflin W. Baily, Westchester, Pa.

I claim spiral spring, S, catch spring, C S, applied to piston heads for pumps or any kind of engines, which combined with the packing of said piston head, for the purpose and in the manner above set forth and described.

**69,748.—ASH SIFTER.**—David W. Barker, New Haven, Ct.

1st. I claim the sifter, in combination with the case, A, and sieve or netting, B, the beater, D, and the plates, E, E, in the manner herein set forth.

2d. In combination with the beaters, D, the handle, E, and case, A, I claim the protecting flange, A.

3d. The combination of the plates, m and n, and sieve, l, with the beaters, D, and netting, B, when constructed so as to form the bearing for the beaters, substantially in the manner herein set forth.

**69,749.—CANT SADDLES.**—John Bea, Newark, N. J., assignor to himself and Timothy D. Gladstone, Boonton, N. J.

I claim, 1st, The plates, b, attached to the bar or bow, A, one at each end, in combination with the plates, C, C, having holes, c, made in them, and firmly attached or other flexible material attached, which are stufed to form pads, B, substantially as shown and described.

2d. The straps, D, attached to the saddle tree between the ends of the bar carrying the plates, b, when said straps are applied to or used in combination with a cart saddle constructed in the manner substantially as herein shown and described.

**69,750.—CULTIVATOR.**—H. Bean, Schuykill, and J. D. Tyron, Lower Providence, Pa.

I claim, 1st, The combination with the main frame, A, of the levers, D, and brace rod, d, arranged to operate as shown and described.

2d. The sliding bar, I, provided with the cord, F, and chains, l, or the equivalents, when arranged to operate as and for the purposes set forth.

**69,751.—WASHING MACHINE.**—D. C. Bernhardt and S. F. Houston, Charlotte, N. C.

We claim the frame, C, having rollers, D, and supported by the springs, when the same is in combination with an inclined beater frame having a roller, and the whole is constructed, arranged, and operated substantially as described.

**69,752.—PROCESS OF OBTAINING USEFUL FIBERS.**—Dana Bickford, Boston, Mass.

I claim, 1st, The preparation of the fiber of the above named weed, substantially as and for the purpose set forth.

2d. The spinning the pulp or fiber with rubber and other gums, also the imitating of velvet plush and other articles, as described.

**69,753.—DEVICE FOR LOCKING DOORS AND WINDOWS.**—A. H. Boyd, Rockville, Mass.

I claim the system of bolts so connected and arranged that all the bolts may be simultaneously operated from one point, both to lock and unlock each bolt, also having an independent provision for operating it from the inside of the room, all substantially as set forth.

**69,754.—SHOE HOLDER.**—A. N. Breneman, Lancaster, Pa.

Antedated Oct. 12, 1867.

I claim the construction and combination of the front piece, A, and back piece, B, united by a hinge, C D E, in the manner and for the purpose specified.

**69,755.—COMB.**—James H. Briggs, Brooklyn, N. Y.

I claim the connector, B, constructed as described, when provided with right-angled fangs, a, fitting into longitudinal grooves cut into the comb, A, as herein set forth, for the purpose specified.

**69,756.—COMBINED PUMP AND MEASURE.**—J. M. Brooks and Perry Munson, Independence, Iowa.

We claim the arrangement of the saddle race, D, segmental pinion, G, and piston, B, in combination with the cylinder, A, nozzle, J, and faucet, H, substantially as and for the purpose set forth.

**69,757.—CARRIAGE WHEEL.**—Reuben Brooks, Jr., Rockport, Mass.

I claim, 1st, The metal clamp, C, constructed as described from a plate of metal, provided with the central hole, a, for the passage of the tenon of the spoke, the sides of said clamp bent around the joints of the felly flush with the side, s and tread and secured to the end of the tenon of the spoke by means of the holes, b, fitting therein, as herein set forth, for the purpose specified.

2d. Joining the ends of the fellys of carriage wheels at the end of a spoke by means of the clamp, C, constructed as described, in such manner that the tension of the spoke shall pass through the hole, a, in said clamp, and firmly secured thereby by the pressure of the ends of the fellys, as herein shown and described.

3d. Supporting the fellys by means of the shoulder of the spoke bearing against the outside of the plate, C, and firmly securing the ends of the fellys by means of rivet bolts passing through the holes, c, in said clamp, substantially as described, for the purpose specified.

4th. The insertion of rivet bolts, in the ends, c, c, through a clamp securing the ends of the fellys of carriage wheels, for the purpose of tightening said fellys, substantially as herein shown and described.

**69,758.—PUMP.**—George Bruce, Corydon, Ind.

I claim the cylinder, A, piston head, C, cast iron disk, H, and connecting rod, h, in said groove, when so constructed and arranged together substantially as and for the purpose specified.

**69,759.—DUMB WAITER.**—F. B. Bryson, Newcastle, Pa.

I claim the arrangement of a dumb waiter, A, going up through the floor of an upper room and the spring cage operated by the rod, h, in combination with the weight, g, and the spring, n, substantially as and for the purpose herein set forth.

**69,760.—HUB AND AXLE FOR VEHICLES.**—D. M. Buckhout, Mount Kisco, N. Y.

I claim the cast metal hub provided with the circular chamber, b, and the mortise, f, to receive the tenons of the spokes, the projections, h, and the tube, P, to the pipe, A, and to each other, as above described.

**69,761.—HAY SPREADER.**—G. E. Burt, Harvard, Mass.

I claim, 1st. The shield, H, constructed and arranged substantially as described for the purposes set forth.

2d. The arrangement of the forks, J J, the arm, k, the shafts, a and P, substantially as described and for the purposes set forth.

**69,762.—WELL POINT.**—Henry G. Cady, St. Louis, Mo.

I claim the manner of connecting the tube, K, to the point, B, and the tube, P, to the pipe, A, and to each other, as above described.

**69,763.—PUMP VALVE.**—H. G. Cady, St. Louis, Mo.

I claim a valve constructed of the cylinder, H, bevelled packing or seat, B, flexible ring, F, with its weighted tongue, A, all arranged substantially as shown and described.

**69,764.—HAY RAKER AND LOADER.**—Archibald Campbell, Peoria, Ill.

I claim, 1st. The rake head, H, when hinged to the rear cross bar of the frame, A, and provided with the teeth, i, bent in such a manner that the upper part of their iron portions shall extend above the rollers, F, and return to the head, H, forming an acute angle, said teeth and rake head adjusted by means of the set screw, Z, in the upper part of the cross bar, as herein described for the purpose specified.

2d. The arrangement of the adjustable pivoted frame, N, roller, P, carriers, N B uprights, O, roller, K, and frame, J, as herein described for the purpose specified.

3d. The combination of the guides, S, with the upper carrier frame, N, substantially as herein shown and described and for the purpose set forth.

3d. The slotted uprights, O, in combination with the pivoted carrier, N and frame, A, for adjusting said carrier to the varying height of the loaded hay, as herein shown and described.

4th. The combination of the guides, S, with the upper carrier frame, N, substantially as herein shown and described and for the purpose set forth.

5th. The slotted uprights, O, in combination with the pivoted carrier, N and frame, A, for adjusting said carrier to the varying height of the loaded hay, as herein shown and described.

6th. The combination of the bent lever or arm, V, and rod, W, with the gear shaft H, and frame of the machine, substantially as herein shown and described and for the purpose set forth.

7th. The arrangement of the levers, J, clutches, G D, shaft, E, rods, U, rollers, F, and shafts of wheels, B, as herein described for the purpose specified.

8th. The combination of the operating levers, J, with the weighted levers, H, and with the frame, E, of the car, substantially as herein shown and described and for the purpose set forth.

9th. The raised and flanged guide block, K, constructed as described, connected with the rails of the track at the point where the branch track leaves the main track, substantially as herein shown and described and for the purpose set forth.

10th. The combination of the guide block, L, with the rails of the track at the point where the branch track leaves the main track, when used in connection with the depressed rail and deepened track, substantially as herein shown and described and for the purpose set forth.

11th. The combination of the guide block, L, with the rails of the track at the point where the branch track leaves the main track, when used in connection with the depressed rail and deepened track, substantially as herein shown and described and for the purpose set forth.

12th. The combination of the guide block, L, with the rails of the track at the point where the branch track leaves the main track, when used in connection with the depressed rail and deepened track, substantially as herein shown and described and for the purpose set forth.

13th. The combination of the guide block, L, with the rails of the track at the point where the branch track leaves the main track, when used in connection with the depressed rail and deepened track, substantially as herein shown and described and for the purpose set forth.

14th. The combination of the guide block, L, with the rails of the track at the point where the branch track leaves the main track, when used in connection with the depressed rail and deepened track, substantially as herein shown and described and for the purpose set forth.

15th. The combination of the guide block, L, with the rails of the track at the point where the branch track leaves the main track, when used in connection with the depressed rail and deepened track, substantially as herein shown and described and for the purpose set forth.

16th. The combination of the guide block, L, with the rails of the track at the point where the branch track leaves the main track, when used in connection with the depressed rail and deepened track, substantially as herein shown and described and for the purpose set forth.

17th. The combination of the guide block, L, with the rails of the track at the point where the branch track leaves the main track, when used in connection with the depressed rail and deepened track, substantially as herein shown and described and for the purpose set forth.

18th. The combination of the guide block, L, with the rails of the track at the point where the branch track leaves the main track, when used in connection with the depressed rail and deepened track, substantially as herein shown and described and for the purpose set forth.

19th. The combination of the guide block, L, with the rails of the track at the point where the branch track leaves the main track, when used in connection with the depressed rail and deepened track, substantially as herein shown and described and for the purpose set forth.

20th. The combination of the guide block, L, with the rails of the track at the point where the branch track leaves the main track, when used in connection with the depressed rail and deepened track, substantially as herein shown and described and for the purpose set forth.

21st. The combination of the guide block, L, with the rails of the track at the point where the branch track leaves the main track, when used in connection with the depressed rail and deepened track, substantially as herein shown and described and for the purpose set forth.

22nd. The combination of the guide block, L, with the rails of the track at the point where the branch track leaves the main track, when used in connection with the depressed rail and deepened track, substantially as herein shown and described and for the purpose set forth.

23rd. The combination of the guide block, L, with the rails of the track at the point where the branch track leaves the main track, when used in connection with the depressed rail and deepened track, substantially as herein shown and described and for the purpose set forth.

24th. The combination of the guide block, L, with the rails of the track at the point where the branch track leaves the main track, when used in connection with the depressed rail and deepened track, substantially as herein shown and described and for the purpose set forth.

25th. The combination of the guide block, L, with the rails of the track at the point where the branch track leaves the main track, when used in connection with the depressed rail and deepened track, substantially as herein shown and described and for the purpose set forth.

26th. The combination of the guide block, L, with the rails of the track at the point where the branch track leaves the main track, when used in connection with the depressed rail and deepened track, substantially as herein shown and described and for the purpose set forth.

27th. The combination of the guide block, L, with the rails of the track at the point where the branch track leaves the main track, when used in connection with the depressed rail and deepened track, substantially as herein shown and described and for the purpose set forth.

28th. The combination of the guide block, L, with the rails of the track at the point where the branch track leaves the main track, when used in connection with the depressed rail and deepened track, substantially as herein shown and described and for the purpose set forth.

29th. The combination of the guide block, L, with the rails of the track at the point where the branch track leaves the main track, when used in connection with the depressed rail and deepened track, substantially as herein shown and described and for the purpose set forth.

30th. The combination of the guide block, L, with the rails of the track at the point where the branch track leaves the main track, when used in connection with the depressed rail and deepened track, substantially as herein shown and described and for the purpose set forth.

31st. The combination of the guide block, L, with the rails of the track at the point where the branch track leaves the main track, when used in connection with the depressed rail and deepened track, substantially as herein shown and described and for the purpose set forth.

32nd. The combination of the guide block, L, with the rails of the track at the point where the branch track leaves the main track, when used in connection with the depressed rail and deepened track, substantially as herein shown and described and for the purpose set forth.

33rd. The combination of the guide block, L, with the rails of the track at the point where the branch track leaves the main track, when used in connection with the depressed rail and deepened track, substantially as herein shown and described and for the purpose set forth.

34th. The combination of the guide block, L, with the rails of the track at the point where the branch track leaves the main track, when used in connection with the depressed rail and deepened track, substantially as herein shown and described and for the purpose set forth.

35th. The combination of the guide block, L, with the rails of the track at the point where the branch track leaves the main track, when used in connection with the depressed rail and deepened track, substantially as herein shown and described and for the purpose set forth.

36th. The combination of the guide block, L, with the rails of the track at the point where the branch track leaves the main track, when used in connection with the depressed rail and deepened track, substantially as herein shown and described and for the purpose set forth.

37th. The combination of the guide block, L, with the rails of the track at the point where the branch track leaves the main track



9th. Making said metallic conductors in a thin ribbon-like form, having one edge near the said electro magnet and the other edge from said magnet, all substantially as described and for the purpose set forth.

69,881.—HAY RAKER AND LOADER.—Hosea Willard, Ver-  
geous, Vt.

I claim, 1st, The supplementary yielding pulleys, e e, attached to the axle, A, and at such points that the rake teeth of the endless elevator may yield or conform to the inequalities of the surface over which they may pass, or to obstructions which may be in their path, substantially as and for the pur-  
pose specified.

2d. The oval wires or clearers, h, placed on the shaft, G, of the endless  
elevator, substantially as and for the purpose set forth.

3d. The springs, K, for connecting the oblique rake wings to the frame, C,  
arranged as described for the purpose specified.

4th. The endless belts, P P, applied to the rake wings, substantially in the  
manner and as for the purpose set forth.

69,882.—OIL CUP.—Charles Williams, Vineland, N. J., as-  
signor by mesne assignments to himself.

I claim the elastic tube, C, in combination with the nozzle, B, and of such  
length that the perforated ball, D, upon its lower end, shall reach either the  
top, E, or bottom of the can, A, as herein described, for the purpose spe-  
cified.

69,883.—JAW FOR LATHE DOGS AND BENCH VISES.—Nathan-  
iel Wilton, Groton, N. H.

I claim the combination in a lathe dog of the semi-cylindrical self-adjusting  
jaws or jaws, D, with the jaws, A and B, and screws, C, or their equivalents,  
substantially as herein shown and described and for the purpose set forth.

69,884.—BROOM HEAD.—J. Wisner, Aurora, and T. Rose,  
Cortlandville, N. Y.

We claim the combination of the screw bolt, g, with thumb screw upon  
each end, and the side or conical pins, d d, with the metal cap or case for  
holding the brush or corn as above described, and for the purpose set forth.

69,885.—CARRIAGE AND BUGGIE TOP BOW IRONS.—G. & A.  
Weber, Davenport, Iowa.

1st. I claim providing sockets for receiving and fastening the ends of the  
bows of buggy and carriage tops, substantially in the manner and for the  
purposes as herein described.

2d. The construction and arrangement of flanges on the sockets, substan-  
tially in the manner and for the purposes as herein described.

3d. The top bows, constructed with plate, A, having pivots, a a a, with  
holes in the pivots for screw, and plate, B, attached by screws, substantially in  
the manner and for the purposes as herein described.

4th. The sockets with flanges and the hinges with pivots, as constructed and  
arranged in combination with the bows, and bow irons, substantially in the  
manner and for the purposes as herein described.

69,886.—WAGON BRAKE.—L. E. Woodard, Owasso, Mich.

1st. I claim the brake bar, B, connected by pins, b, working in the slot, c,  
in the ends of the cross bar, a, all constructed and arranged as described, for  
the purpose specified.

2d. The slotted metallic slide piece, D, upon the wagon reach, connected  
at one end to the bar, B, and in which the friction roller, k, is pivoted, con-  
structed as described and operated by means of the eccentric piece, E, as  
set forth, for the purpose specified.

69,887.—COTTON PRESS AND FEEDER.—Henry Zellner, Co-  
lumbia, Tenn.

1st. I claim the triangular chamber, B, situated between the shute, A, and  
the press, arranged as and for the purpose above described.

2d. I claim the arrangement of the foraminated cover, B', in connection  
with the chamber, B, and shute, A, in a hay or cotton press, substantially as  
and for the purpose described.

3d. I claim the combination of the shaft, I, cords or chains, H H', and tog-  
gle joint lever, F, with the pulleys, II, working at the end of the fixed beam,  
K, substantially as and for the purpose specified.

4th. I claim the use of the pawls, o o o, substantially as and for the purpose  
described.

5th. I claim the arrangement of the shute, A, chamber, B, rollers, C C',  
lever, E, block, G, tube, D, and pawls, o o o, substantially as and for the pur-  
pose set forth.

69,888.—BURGLAR ALARM.—G. S. Acker, Kalamazoo, Mich.

1st. I claim connecting the spring alarm with the tripping wire, W, by the  
arrangement and combination of the pallet lever, H, with the toothed quad-  
rant, I J, pawl, F, and tension spring, S, substantially as and for the purpose  
specified.

2d. I claim in combination with the spring alarm and tripping arrange-  
ment aforesaid, the geared levers, L L, when the same are connected to the  
window panes and operated by the window sashes of a building, substan-  
tially in the manner and for the uses set forth.

69,889.—ROOFING COMPOSITION.—C. B. Allen, St. Louis, Mo.

I claim the within described composition, composed of the articles herein  
set forth and used for the purposes specified.

69,890.—BOILER.—Henry Adler, Yellow Springs, Ohio.

1st. I claim the arrangement, substantially as described, of the hot water  
jacket, A B K, steam chamber, E e, digester, G H M, and stopper, L, as and  
for the purpose specified.

2d. In combination with the elements of the preceding clause, I claim the  
rotatable loop, C C' e, serving the double purpose of handle and catches.

69,891.—MANUFACTURE OF MATCHES.—Emery Andrews,  
Portland, Me.

I claim the match splints in the form of a card, substantially in the  
manner and for the purpose specified.

69,892.—CAR BRAKE.—John L. Barnes, Elma Green, Ind.

I claim the swinging frame, G, with its shafts, E and R, wheels, J, gears,  
H and I, used in combination with wheels, M M, upon the driving axle, and  
cords, C, rods, D D, and lever, R, for operating the carriage brakes by means  
of the lever, F, roller, d, and cord, a, when arranged in the manner and used  
substantially as and for the purposes specified.

69,893.—BRIDLE.—W. R. Beans, Brownsburg, Pa.

I claim the headstalls constructed with extensions rearwardly from the  
forehead strap having loops, b', at their rear ends for the retention of the  
safety reins in the desired position on the horse's neck, substantially as  
shown and described.

69,894.—APPARATUS FOR PROVING GAS PIPES.—A. C. Beard-  
slee, Brooklyn, N. Y.

I claim, 1st, The combination of the bell, A, base piece, B, with its passages  
F H, diaphragm, C, spring borne graduated rod, D, and check valve, J, all  
for proving gas pipes substantially as and for the purpose herein set forth.

2d. The arrangement in connection with a diaphragm indicator substan-  
tially of the character specified, of an ether box, essentially as and for the  
purpose or purposes herein set forth.

69,895.—APPARATUS FOR DAMPING AND GUMMING LABELS.—  
Joseph Bent, Goat near Cockermouth, England, and George O. Luckman,  
Manchester, England.

We claim the apparatus described consisting of a reservoir connected to a  
dampling chamber provided with a perforated plate or any combination of  
similar parts answering the same purposes and for effecting the same objects.

69,896.—COMBINED HOSE TONGS, CLAMP, WINCH AND PICK.  
Harry Bitter, Philadelphia, Pa.

I claim the combination of the facing ring, D, wrenches, d and e, and pick  
f, with a hose clamp, substantially as described and for the purposes speci-  
fied.

69,897.—APPARATUS FOR RENDERING LARD AND TALLOW.—  
Amos Broadnax, New York City.

I claim, 1st, Rendering fat with a fire heat either in an open or a close  
tank by inclosing said tank in a heating chamber so made and arranged as to  
entirely surround the tank substantially as and for the purpose herein set forth.

2d. Combining a dry rendering apparatus in a dry heating chamber made  
of metal and placing said dry metal heating chamber in a brick chamber  
over the fire or furnace and so arranged as to leave a fire around the metal  
chamber, substantially as described.

3d. The use of the intervening plate, S, either with or without the fire  
brick or clay lining between the furnace and the tank by which the fire  
can be entirely excluded from the tank.

4th. Arranging an open rendering tank in a heating chamber made to  
entirely inclose the tank, arranged to allow the gas and vapor to escape in the  
chamber under a furnace, substantially as described.

5th. In combination with a rendering tank the use of a thermometer ar-  
ranged in a tube in said tank filled with mercury, substantially as described.

6th. The use of a ventilator in combination with a rendering tank inclosed  
in a heating chamber for the purpose of reducing the temperature in said  
chamber, substantially as described.

7th. Making an intervening fire between the tank and the fire fuel to aid in  
regulating the application of heat to the tank, substantially as described.

69,898.—BED CLOTHES HOLDER.—M. D. Brooks, Albany, N. Y.

I claim the combination of the rolls, E E, with the arms, A A and B B, and  
spiral springs, C C, arranged on a bedstead for holding the clothes of the bed,  
substantially as described.

69,899.—ROWLOCK FOR BOATS.—C. C. Burrows, Mystic River,  
Conn.

1st. I claim the slotted plate, A, Figs. 3 and 4, in combination with a re-  
versible cap, C, secured thereto and revolving thole permanently attached to  
the cap, substantially as set forth.

2d. Combination with the plate, A, having a longitudinal slot, A', the re-  
versible cap and thole and a button for securing the part rigidly when in use,  
arranged substantially as set forth.

69,900.—HAT VENTILATOR.—C. H. Coffin, San Francisco, Cal.

I claim as a new article of manufacture a hat ventilator provided with a  
slide or valve to close the opening and a hinge of flexible metal teeth for  
fastening it to the hat.

69,901.—FOUNTAIN BRUSH.—Julius Davis, McLean, N. Y.

I claim the revolving hollow cylinder, G, having its entire curved sides  
pierced with orifices, e, and covered with cloth, c, to allow the paint or white  
wash within it to escape gradually and spread itself evenly over the surface  
to be covered as the cylinder is rolled over it, substantially as and for the  
purpose described.

The combination and arrangement of the revolving hollow cylinder,  
G, and brushes, B, when the cylinder and brushes are constructed and used  
substantially as and for the purpose hereinbefore particularly described.

3d. The combination and arrangement of the revolving hollow cylinder,  
G, brushes, B, and cup, A, when the cylinder, brushes and cup are constructed  
and used substantially as and for the purpose set forth, as described.

4th. The combination and arrangement of the revolving hollow cylinder,  
G, brushes, B, and cup, A, frame support, b C and C' socket, D, and handle, E,  
when the whole are constructed and used substantially as and for the pur-  
pose described.

69,902.—COOKING STOVE.—W. C. Davis, Cincinnati, Ohio.

I claim the base or pedestal, B, forming a completely enclosed closet or  
chamber having one or more doors, J, a floor, E, and interlocking flanges, D,  
and being adapted to take the place of the customary leg or feet of an or-  
dinary cast cooking stove, as set forth.

69,903.—GRINDING MILL.—John Donaldson, Rockford, Ill.

1st. I claim the arrangement of the slots, II, in wheel, E, with the pin  
adjustable in said slots and the feed levers, a and b, and discharge lever, a',  
operating in connection with the feed and discharge valves and the hulling  
machinery, substantially as described and for the purpose set forth.

2d. The arrangement and construction of the feed valve, P, and groove, R,  
in hopper, S, substantially as described.

69,904.—MODE OF COATING WROUGHT IRON WITH CAST STEEL.  
Josiah W. Ellis, Pittsburgh, Pa.

I claim as a new and merchantable article of manufacture slabs, sheets,  
plates, bars and rods of wrought iron having a uniform coating, face or sur-  
face of cast steel, applied as hereinbefore set forth on any one or more or on  
all sides of the same and of any required degree of thickness.

69,905.—KNIFE CLEANER.—John A. Ewins, South Boston,  
Mass.

I claim the combination and arrangement of the polishing or cleaning  
cylinder and its operative mechanism with the self-adjusting presser and the  
guard, the whole being applied to a frame so as to operate as described.

69,906.—TWEED.—Frederick Fisher, Gloucester, Mass.

I claim the water tight vessel or reservoir, I J, surrounding or partially  
inclosing the main air tube, H, and the tubes, K K, in combination with the  
pipes, P and G, and the reservoir, E, substantially as and for the purpose  
described.

69,907.—TENTER BARS FOR STRETCHING CLOTH.—J. Force  
and G. W. Renwick, Elgin, Ill.

We claim the combination of bars, H H', friction wheels, t and t',  
screw, N, rod, L, and levers, e e, substantially as and for the purpose de-  
scribed.

69,908.—HARVESTER.—John Fox, Baltimore, Md.

I claim the broken or interrupted surface of the cane groove on the inner  
face of the driving wheel for actuating the roller and lever, substantially as  
herein recited.

69,909.—BRICK MOLD.—Francis M. Franklin, O. H. McIntire  
and William Whitley, Springfield, Ohio.

We claim the plunger with projecting centers on their inner faces to re-  
ceive and support the packing and packing plates around them, as and for  
the purpose herein described.

69,910.—STRUCTURE FOR STRETCHING CLOTH.—J. Force  
and G. W. Renwick, Elgin, Ill.

I claim the combination of bars, H H', friction wheels, t and t',  
screw, N, rod, L, and levers, e e, substantially as and for the purpose de-  
scribed.

69,911.—WATER WHEEL.—P. D. Pike, Stowe, Vt.

I claim the cylindrical water wheel, A, with its center partition, B, having  
two apertures, G G, and two adjustable gates, B B, regulated by the lever, C,  
when constructed, combined, and operating as herein described and for the  
purpose set forth.

69,912.—WEIGHING SCALES.—J. P. Pope and J. T. Whipple,  
Chicago, Ill.

1st. We claim platform, C, suspended from platform, B, of the scales above,  
substantially as and for the purpose set forth.

2d. The combination of rods, o o, jointed levers, e e', lever, W, and hold-  
ing or support rod, t, substantially as described.

69,913.—SPARE ARRESTER.—Andrew Pearall, Atlanta, Ga.

I claim the arrangement of the pipe, B, with its flange, E, and disk, G, as  
constructed in combination with pipe, A, having flange, D, formed as described,  
to project beneath flange, E, having outlet into chamber, C, as set forth and  
for the purposes described.

69,914.—WATER WHEEL.—P. D. Pike, Stowe, Vt.

I claim the cylindrical water wheel, A, with its center partition, B, having  
two apertures, G G, and two adjustable gates, B B, regulated by the lever, C,  
when constructed, combined, and operating as herein described and for the  
purpose set forth.

69,915.—MACHINERY FOR BENDING METALS.—Robert Potts,  
Chatham, N. Y.

I claim the adjustable frame, D, arranged as specified, in combination with  
the sweep, A, substantially as and for the purpose described.

69,916.—EXTENSION TABLE.—A. E. Preston, Battle Creek,  
Mich.

I claim the combination of the revolving top, E, pivot, D, and receptacle, F,  
with the adjustable sliding frames, B and B', the whole constructed and op-  
erating substantially as described, and for the purpose set forth.

69,917.—RAILWAY CAR SEAT.—S. H. Rhoades and W. Carroll,  
Clyde, Ohio.

1st. We claim the extension links, C, when constructed with a sleeve, D,  
slide, E, and disk, F, as arranged and pivoted to the back, B, and seat, A, in  
the manner and for the purpose substantially as set forth.

2d. The disk, F, provided with a circular ratchet in combination with the  
spring, G, and bar, E, constructed and arranged in relation to each other  
for the purpose substantially as set forth.

3d. The adjustable head rest or section, K, spring, R, stay bars, M, and rod,  
O, as arranged in combination with the back, B, in the manner and for the  
purpose set forth.

69,918.—BAKING FRAME.—T. C. Riddell, Wilmington, Del.

I claim providing the ordinary baking pan with a wooden frame and stir-  
ring rods for holding it in place for the purpose of evenly baking bread or cakes  
in the manner herein before described.

69,919.—SUBMARINE VESSEL.—E. C. B. Rick, Hermann, Mo.

I claim the arrangement of a series of crank shafts, a, carrying pins, c, and  
connected by a rod, d, in combination with the adjusting screw, a, and vessel,  
A, constructed and operating substantially as and for the purpose set forth.

69,920.—BREE

in an inclined position, substantially in the manner and for the objects specified.

**69,965.—APPARATUS FOR COOLING, FREEZING, AND HEATING.**

Inventor—Daniel E. Somes, Washington, D. C.

1st. I claim the combination of the vacuum and compressing chambers or their equivalents with the pumps or their equivalents.

2d. Atomizing tubes in combination with a vacuum or partial vacuum.

3d. Means for closing the walls of the vacuum chamber for the admission of liquid, air, gas, or vapor.

4th. A tube with an atomizing lip or projection, in combination with a vacuum or partial vacuum.

5th. Closed air spaces, or non-conducting material, or refrigerating substance, or compounds, surrounding a vacuum or partial vacuum.

6th. A vacuum chamber constructed substantially as and for the purpose set forth.

7th. A compressing chamber with atomizing tubes or holes, substantially as and for the purpose set forth.

8th. Compressing and vacuum chambers with a safety valve between, as and for the purpose set forth and for other purposes.

9th. Pipes and cook, G, as and for the purpose described.

10th. Non-conducting spaces or substances between the compressing and vacuum chambers, substantially as and for the purpose set forth.

11th. The case, H, in combination with a compressing chamber or with a vacuum or partial vacuum chamber.

12th. Tubes or channels extending through the compressing or vacuum chamber, substantially as and for the purpose set forth.

13th. Apartments or vessels constructed substantially as herein described, to prevent conduction of heat or cold, in connection with apparatus for rarefying or expanding air, gas, or other volatile substance.

14th. Chemical substances heretofore named, or others which may volatilize, singly or in combination, when used in a vacuum or partial vacuum in the form of mist or spray.

15th. Material for lining the compressing and vacuum chambers, for the purposes set forth.

16th. A chamber containing liquid, air, gas, food, or any substance to be cooled, with channels tubes or spaces in, through, or around the same for passing, forcing, or drawing spray formed by atomizing a liquid or liquids.

REISSUES.

**2,776.—WORKING BUTTER.**—J. P. Corbin, Whitney's Point, N. Y., assignee by means assignments of Joseph Seymour. Patented December 20, 1865.

1st. I claim a vibrating rod, F, handle, G, and butter worker, H, combined and arranged to operate as shown, or in an equivalent manner, or the purpose set forth.

2d. The combination of the tray, B, with the butter working apparatus, arranged for joint operation, substantially as shown and described.

3d. The manner of tipping the tray or bowl to drain off the fluids, also of securing it to the table or frame for the purpose set forth.

**2,777.—VOLUTE SPRING.**—Joseph Hobart, Waltham, Mass., assignee of Daniel G. Rollin. Patented February 23, 1865.

1st. A double volute spring, having the bearing ends symmetrical, and playing endwise in the same line.

2d. A double volute spring, composed of a single plate, operating substantially as described.

**2,778.—CLEANING ANIMAL CHARCOAL.**—The Union Sugar Refinery, Charlestown, Mass., assignee of Gustavus A. Jasper. Patented March 27, 1865.

I claim the new or improved process substantially as hereinbefore described, of cleaning charcoal either after or before its use, in a filter, for the censuring of a saccharine or other liquid, the same consisting in boiling the charcoal in an acid solution, and washing it, the whole being essentially as specified.

I also claim, as the invention of the said Jasper, for removal from the charcoal of the gammon and other matter, except the lime or alkali matter, the treatment or process of treating the charcoal without the use of acid, the same consisting in boiling the charcoal in water, or so boiling it and washing it, the charcoal being subsequently dried, as set forth.

**2,779.—MACHINE FOR MAKING NEEDLES.**—C. P. S. Wardwell, Lake Village, N. Y., assignee by means assignments of Frederick P. Parker. Patented June 15, 1865.

1st. I claim the combination of the traveling nippers or gripe, and stationary wire holder, or equivalent feeding device, cutting-off shears, or device, eye or groove punch or die, one or both, and wire or needle carrier, or equivalent mover, substantially as and for the purposes herein set forth.

2d. I also claim the combination of the cutting-off shears, or device, eye or groove, punch or die, one or both, and wire or needle carrier, or equivalent mover, substantially as and for the purposes herein set forth.

3d. I also claim the combination of the wire or needle carrier, or equivalent mover, the flattening wheel, and the adjustable bed or block, to keep the needle blanks or wires to the flattening wheel, substantially as and for the purposes set forth.

4th. I also claim the combination of the wire or needle carrier, or equivalent mover, with the cutting or grinding wheel, in, for flattening or slabbing the needle wire or blanks, substantially as and for the purposes set forth.

5th. I also claim the combination of the wire or needle carrier, or equivalent mover, the flattening wheel, and the adjustable bed or block, to keep the needle blanks or wires to the flattening wheel, substantially as and for the purposes set forth.

6th. I also claim the combination of the wire or needle carrier, or equivalent mover, with the cutting or grinding wheel, in, for flattening or slabbing the needle wire or blanks, substantially as and for the purposes set forth.

7th. I also claim the combination of the wire or needle carrier, or equivalent mover, and the bar bending mechanism, substantially as herein specified.

8th. I also claim a combination of mechanical devices, as described, or equivalents thereof, by which needles are automatically made from the wire, including or not the bending of the bars and the polishing of the needles.

**2,780.—ROTARY HARROW.**—O. D. Barret, Washington, D. C.

I claim causing two harrows joined together, to rotate in opposite directions, by attaching the draught either above or below the plow, passing through the joint, D, parallel to the line of draught, substantially as specified.

9d. I also claim the combination of the traveling nippers, or gripe, and stationary wire holder or equivalent feeding device, an eye or groove punch or die, one or both, and wire or needle carrier, or equivalent mover, substantially as and for the purposes herein set forth.

10th. I also claim the combination of the traveling nippers or gripe, and stationary wire holder, or equivalent feeding device, cutting-off shears or device, and one or more tubes or equivalent wire or needle holder, substantially as and for the purposes specified.

11th. I also claim the combination of one or more tube, or equivalent wire holder, and the wire or needle carrier, substantially as herein described, or equivalent device, for moving the wire or needle blanks, to the action of the operative devices, substantially as and for the purposes herein set forth.

12th. I also claim the combination of the cutting-off shears, or device, eye or groove, punch or die, one or both, and wire or needle carrier, or equivalent mover, substantially as and for the purposes herein set forth.

13th. I also claim the combination of the wire or needle carrier, or equivalent mover, with the cutting or grinding wheel, in, for flattening or slabbing the needle wire or blanks, substantially as and for the purposes set forth.

14th. I also claim the combination of the wire or needle carrier, or equivalent mover, the flattening wheel, and the adjustable bed or block, to keep the needle blanks or wires to the flattening wheel, substantially as and for the purposes set forth.

15th. I also claim the combination of the wire or needle carrier, or equivalent mover, with the cutting or grinding wheel, in, for flattening or slabbing the needle wire or blanks, substantially as and for the purposes set forth.

16th. I also claim the combination of the wire or needle carrier, or equivalent mover, and the bar bending mechanism, substantially as herein specified.

17th. I also claim a combination of mechanical devices, as described, or equivalents thereof, by which needles are automatically made from the wire, including or not the bending of the bars and the polishing of the needles.

18th. I also claim the combination of the wire or needle carrier, or equivalent mover, with the cutting or grinding wheel, in, for flattening or slabbing the needle wire or blanks, substantially as and for the purposes set forth.

19th. I also claim the combination of the wire or needle carrier, or equivalent mover, and the bar bending mechanism, substantially as herein specified.

20th. I also claim the combination of the wire or needle carrier, or equivalent mover, with the cutting or grinding wheel, in, for flattening or slabbing the needle wire or blanks, substantially as and for the purposes set forth.

21st. I also claim the combination of the wire or needle carrier, or equivalent mover, and the bar bending mechanism, substantially as herein specified.

22nd. I also claim the combination of the wire or needle carrier, or equivalent mover, with the cutting or grinding wheel, in, for flattening or slabbing the needle wire or blanks, substantially as and for the purposes set forth.

23rd. I also claim the combination of the wire or needle carrier, or equivalent mover, and the bar bending mechanism, substantially as herein specified.

24th. I also claim the combination of the wire or needle carrier, or equivalent mover, with the cutting or grinding wheel, in, for flattening or slabbing the needle wire or blanks, substantially as and for the purposes set forth.

25th. I also claim the combination of the wire or needle carrier, or equivalent mover, and the bar bending mechanism, substantially as herein specified.

26th. I also claim the combination of the wire or needle carrier, or equivalent mover, with the cutting or grinding wheel, in, for flattening or slabbing the needle wire or blanks, substantially as and for the purposes set forth.

27th. I also claim the combination of the wire or needle carrier, or equivalent mover, and the bar bending mechanism, substantially as herein specified.

28th. I also claim the combination of the wire or needle carrier, or equivalent mover, with the cutting or grinding wheel, in, for flattening or slabbing the needle wire or blanks, substantially as and for the purposes set forth.

29th. I also claim the combination of the wire or needle carrier, or equivalent mover, and the bar bending mechanism, substantially as herein specified.

30th. I also claim the combination of the wire or needle carrier, or equivalent mover, with the cutting or grinding wheel, in, for flattening or slabbing the needle wire or blanks, substantially as and for the purposes set forth.

31st. I also claim the combination of the wire or needle carrier, or equivalent mover, and the bar bending mechanism, substantially as herein specified.

32nd. I also claim the combination of the wire or needle carrier, or equivalent mover, with the cutting or grinding wheel, in, for flattening or slabbing the needle wire or blanks, substantially as and for the purposes set forth.

33rd. I also claim the combination of the wire or needle carrier, or equivalent mover, and the bar bending mechanism, substantially as herein specified.

34th. I also claim the combination of the wire or needle carrier, or equivalent mover, with the cutting or grinding wheel, in, for flattening or slabbing the needle wire or blanks, substantially as and for the purposes set forth.

35th. I also claim the combination of the wire or needle carrier, or equivalent mover, and the bar bending mechanism, substantially as herein specified.

36th. I also claim the combination of the wire or needle carrier, or equivalent mover, with the cutting or grinding wheel, in, for flattening or slabbing the needle wire or blanks, substantially as and for the purposes set forth.

37th. I also claim the combination of the wire or needle carrier, or equivalent mover, and the bar bending mechanism, substantially as herein specified.

38th. I also claim the combination of the wire or needle carrier, or equivalent mover, with the cutting or grinding wheel, in, for flattening or slabbing the needle wire or blanks, substantially as and for the purposes set forth.

39th. I also claim the combination of the wire or needle carrier, or equivalent mover, and the bar bending mechanism, substantially as herein specified.

40th. I also claim the combination of the wire or needle carrier, or equivalent mover, with the cutting or grinding wheel, in, for flattening or slabbing the needle wire or blanks, substantially as and for the purposes set forth.

41st. I also claim the combination of the wire or needle carrier, or equivalent mover, and the bar bending mechanism, substantially as herein specified.

42nd. I also claim the combination of the wire or needle carrier, or equivalent mover, with the cutting or grinding wheel, in, for flattening or slabbing the needle wire or blanks, substantially as and for the purposes set forth.

43rd. I also claim the combination of the wire or needle carrier, or equivalent mover, and the bar bending mechanism, substantially as herein specified.

44th. I also claim the combination of the wire or needle carrier, or equivalent mover, with the cutting or grinding wheel, in, for flattening or slabbing the needle wire or blanks, substantially as and for the purposes set forth.

45th. I also claim the combination of the wire or needle carrier, or equivalent mover, and the bar bending mechanism, substantially as herein specified.

46th. I also claim the combination of the wire or needle carrier, or equivalent mover, with the cutting or grinding wheel, in, for flattening or slabbing the needle wire or blanks, substantially as and for the purposes set forth.

47th. I also claim the combination of the wire or needle carrier, or equivalent mover, and the bar bending mechanism, substantially as herein specified.

48th. I also claim the combination of the wire or needle carrier, or equivalent mover, with the cutting or grinding wheel, in, for flattening or slabbing the needle wire or blanks, substantially as and for the purposes set forth.

49th. I also claim the combination of the wire or needle carrier, or equivalent mover, and the bar bending mechanism, substantially as herein specified.

50th. I also claim the combination of the wire or needle carrier, or equivalent mover, with the cutting or grinding wheel, in, for flattening or slabbing the needle wire or blanks, substantially as and for the purposes set forth.

51st. I also claim the combination of the wire or needle carrier, or equivalent mover, and the bar bending mechanism, substantially as herein specified.

52nd. I also claim the combination of the wire or needle carrier, or equivalent mover, with the cutting or grinding wheel, in, for flattening or slabbing the needle wire or blanks, substantially as and for the purposes set forth.

53rd. I also claim the combination of the wire or needle carrier, or equivalent mover, and the bar bending mechanism, substantially as herein specified.

54th. I also claim the combination of the wire or needle carrier, or equivalent mover, with the cutting or grinding wheel, in, for flattening or slabbing the needle wire or blanks, substantially as and for the purposes set forth.

55th. I also claim the combination of the wire or needle carrier, or equivalent mover, and the bar bending mechanism, substantially as herein specified.

56th. I also claim the combination of the wire or needle carrier, or equivalent mover, with the cutting or grinding wheel, in, for flattening or slabbing the needle wire or blanks, substantially as and for the purposes set forth.

57th. I also claim the combination of the wire or needle carrier, or equivalent mover, and the bar bending mechanism, substantially as herein specified.

58th. I also claim the combination of the wire or needle carrier, or equivalent mover, with the cutting or grinding wheel, in, for flattening or slabbing the needle wire or blanks, substantially as and for the purposes set forth.

59th. I also claim the combination of the wire or needle carrier, or equivalent mover, and the bar bending mechanism, substantially as herein specified.

60th. I also claim the combination of the wire or needle carrier, or equivalent mover, with the cutting or grinding wheel, in, for flattening or slabbing the needle wire or blanks, substantially as and for the purposes set forth.

61st. I also claim the combination of the wire or needle carrier, or equivalent mover, and the bar bending mechanism, substantially as herein specified.

62nd. I also claim the combination of the wire or needle carrier, or equivalent mover, with the cutting or grinding wheel, in, for flattening or slabbing the needle wire or blanks, substantially as and for the purposes set forth.

63rd. I also claim the combination of the wire or needle carrier, or equivalent mover, and the bar bending mechanism, substantially as herein specified.

64th. I also claim the combination of the wire or needle carrier, or equivalent mover, with the cutting or grinding wheel, in, for flattening or slabbing the needle wire or blanks, substantially as and for the purposes set forth.

65th. I also claim the combination of the wire or needle carrier, or equivalent mover, and the bar bending mechanism, substantially as herein specified.

66th. I also claim the combination of the wire or needle carrier, or equivalent mover, with the cutting or grinding wheel, in, for flattening or slabbing the needle wire or blanks, substantially as and for the purposes set forth.

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78th. I also claim the combination of the wire or needle carrier, or equivalent mover, with the cutting or grinding wheel, in, for flattening or slabbing the needle wire or blanks, substantially as and for the purposes set forth.

## LARGE SALE OF PUBLIC PROPERTY.

OFFICE OF ARMY CLOTHING AND EQUIPAGE,  
No. 18 STATE STREET, NEW YORK, Oct. 4, 1867.  
**WILL BE SOLD AT PUBLIC AUCTION,** at the Depot of Army Clothing and Equipment, at Washington street, New York city, on TUESDAY, the 22d day of October, 1867, commencing at 11 o'clock A. M., to be continued from day to day, the following articles of Army Clothing and Equipment:  
11,621 Woolen Blankets. 38 Stable Frocks.  
7,211 Rubber do. 244 C. F. Drawers.  
5,068 Do. Ponchos. 7,056 Domest. do.  
65,455 Pinged Boots, 14,626 Trowers, horse.  
10,000 Do. 10,000 Drills.  
88,125 Hand-sewed Boots, 32,974 Uniform hats, untrim'd.  
pairs. 31,261 Do. Inf. trimmed.  
36,320 Hand-sewed Boots, 3,078 Do. Cav. trimmed.  
pairs. 900 Do. Art. trimmed.  
21,625 Pegged Bootaps, 184,835 Great Coat Straips.  
22,561 Great Coats, horse. 184,656 Jackets, Cav. priv.  
16,593 Do. Do. not. 8,265 Uniforms, Cav. pri.  
25,620 Day Coat Shirts. 2,520 Do. Do. Art. do.  
69,919 Stable Shirts. 27,113 Hat Cards, Inf.  
124 Uniforms, Art. 400 Do. Do.  
Musicians. Stewards.  
284 Jackets, Cav. do. 144 Eagles for Lt. Art.  
325 Uniforms, Engi.  
neers. caps.  
26 Do. do. Ordnance. 8 Trumps, do. do.  
325 Drills, Ordnance Music. 27,112 Drills, Inf.  
981 Do. Inf. do. 14,626 Drills, Castles.  
10,000 Muskete Bars. 4,022 Shells and Flames.  
25,353 Knapsacks. 50,255 Crossed Sabers.  
3,000 Do. Straps, sets. 40,265 Do. Cannon.  
100,261 Haversacks, painted. 217,148 Hat Bugles.  
300 Do. unpainted. 50,197 Do. do. Art.  
22,411 Cantines. 1,250 Do. Letters.  
4,700 Cotton Overalls. 1,250 Do. Cards and Tas.  
1,24,125 Hat Number. 400 Do. Scales and Tas.  
19,400 Do. Feathers. 400 Do. Buttons.  
1,023 Do. Bugles, Non. Reg.  
1,000 Brass Scales, N.C.S., pairs. 4,365 Uniform Scales, Sergt's, pairs.  
100 Scale Buttons, pairs. 100 Scale Buttons, Sergt's, pairs.  
424 Hosp. Stewards' Let.  
ters U. 424 Hosp. Stewards' Let.  
ters S.  
1,542 Scale Slides, pairs. 4,417 Cap Covers.  
4,385 Pickeas. 4,385 Pickeas.  
363 Rings for Lt. Art. Caps, pairs.  
31 Bed Hair Pillows. 426 Stoves, foot, gray  
10,000 Pickaxas. blue.  
16,325 Do. Handles. 130 Trowsers, foot, gray  
16,336 Axes, felling. 130 Trowsers, foot, gray  
6,069 Do. Handles. 130 Trowsers, foot, gray  
16,316 Do. Slings. 130 Trowsers, foot, gray  
327 Hatchets. 130 Trowsers, foot, gray  
16,326 Do. Handles. 130 Trowsers, foot, gray  
19,382 Do. Slings. 130 Trowsers, foot, gray  
9,000 Spades. 130 Trowsers, foot, gray  
1,544 Shovels. 51 Iron Pots.  
5,947 Stove Pipes, pieces 130 Trowsers, foot, gray  
2 Camp Color Staffs. 130 Trowsers, foot, gray  
35 Tent Straps. 130 Trowsers, foot, gray  
65,208 Men's Panes. 130 Trowsers, foot, gray  
26,900 Camp Kettles. 130 Trowsers, foot, gray  
2,316 Tents. 130 Trowsers, foot, gray  
47 Wall Tent Flies. 130 Trowsers, foot, gray  
3 Marque Tents. 130 Trowsers, foot, gray  
465 Hopt. Tent Poles. 130 Trowsers, foot, gray  
sets.  
Also, a quantity of irregular and damaged clothing and equipment, samples of all can be seen at the Depot, ten days prior to the sale, and catalogues will be furnished on application at this office, or at the Depot, No. 300 Washington street.  
Terms cash, in government funds; ten per cent down and the balance before the goods are taken from the depot. The goods must be removed from the depot within ten days from date of sale, under forfeiture of purchase and the ten per cent deposited.  
By order of the Quartermaster-General.

C. G. SAWTELLE,  
Bt. Brig.-Gen'l and Q'm'r U. S. A., in charge of Depot A., C. and E.

16 8

## BODINE'S JONVAL TURBINE WATER WHEEL, combining great economy in the use of water, simplicity, durability, and general adaptation to all purposes, so that it can be used as a motive power.

The undersigned manufacturers of the above wheel are prepared to furnish and warrant the same to give more power than any other wheel made in the same amount of water.

These wheels have been tested with all the wheels of note in the country, and have never failed to prove their superiority. We therefore propose to put them in for any responsible party, warranting them to work up to our representations, failing in which we

will take them out at our own expense. The attention of millwrights is invited to this wheel. Agents wanted in every county in the United States and Canada. Send for descriptive circular.

J. H. BODINE & CO., Mount Morris, New York.

12 cwt.

R. P. ROTHWELL,  
MINING Engineer and Metallurgist, mem.  
ber of the Geological Society of France, etc.

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Particular attention paid to examining and reporting on Gold, Tin, Copper, Iron, Coal, and all other kinds of mineral property, and to the establishment of mines and metallurgical works in any part of the country. Ores assayed.

12 cwt.

L. NEWTON PIERCE & CO., 14 cwt.

47 North Eleventh st., Philadelphia, Pa.

14 cwt.

GILLESPIE HYDRAULIC GOVERNOR  
for Water Wheels.—The only Governor that, on a change of labor, moves the gate instantly to the required point, AND STOPS—gives an evenness of speed not exceeded by the best steam engine; operates the largest gates with ease; saves a large per centage of repairs, and insures against accidents from sudden stops. Entire satisfaction guaranteed. Send for circular.

JOHN S. BOGGS, Treas. Gillespie Governor Co., 13 cwt.

13 Kilby street, Boston, Mass.

PLATINUM—for all Laboratory and Manufacturing purposes. Platinum Scrap and Ore purchased. H. M. DAYNOL, Office, 75 Broadway, N. Y. 8 10 cwt.

SPICE CAN AND BLACKING BOX  
Makers, send for circular of Painter's Patent Riveting device, dispensing with solder. Great economy. 30  
W. PAINTER & CO., 45 Holliday street, Baltimore.

13 cwt.

L. LE COUNT'S Patent Hollow Lathe Dogs, 6 Sizes, from  $\frac{1}{2}$  to 2 inches. 8 8 00

12 Sizes, from  $\frac{1}{2}$  to 4 inches. 417 20

Improved Machinists' Clamps, 5 sizes. 311 10

Stout Boiler-makers' Clamps. 8 4 00

All with Steel Screws, well fitted. Send for circular.

C. W. LE COUNT, South Norwalk, Ct.

13 cwt.

TINNER'S TOOLS—Good Second-hand set for sale.

GEO. G. ATWOOD, Geneva, N. Y.

10 5 cwt.

WOOD-WORKING MACHINERY, The

SUBSCRIBER is Agent in New York for J. A. Fay

& Co., G. B. Rogers & Co., Bell & Williams, Richardson, Merriam & Co., H. B. Smith, Gray & Woods, Lane & Boddy, D. Doncaster, and all other manufacturers of Woodworking Machines. S. C. HILLS, No. 12 Platt st.

13 cwt.

## OIL! OIL!! OIL!!!

FIRST PREMIUM.....PARIS, 1867.

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PEASE'S IMPROVED OILS!

Acknowledged the Best in the World! The Highest Award over all others!

Grand Silver Medal and Diploma!

The Only One to the United States awarded to

F. S. PEASE,

For the Greatest Excellence in Oils for Lubricating and Burning.

London,.....1862.

## WORLD'S FAIR—TWO PRIZE MEDALS

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na, Lard, and Premium Petroleum, as the Best made!

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These Improved Oils cost no more than many of the common oils in market, while they are endorsed by the greatest experience and highest authority in the United States and Europe, and offered to the public upon the most thorough, reliable, and practical tests as the Best Oils made for Lubricating and Burning.

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F. S. PEASE, Oil Manufacturer,

32 Main street, Buffalo, N. Y.

N. B.—Reliable orders filled for any part of the world.

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A NOWSIC EMERY, Manufactured at

Bath, Me., all numbers from four up to one hundred and twenty, is the only true mine in the world, excepting in Turkey. For sale in quantities to cut, at reduced prices, by STANWOOD, MCLELLAN & FULLER, 24 Central street, Boston.

F. G. GODDARD, St. Louis, Mo.

O. ORVILLE FAY, Chicago, Ill.

From Stanly Rule and Lever Co., New Britain, Conn.

We have been using some number of our Emery on steel, and it gives good satisfaction. If it proves to work as on trial, this far, we shall use nothing else. For some reason, London emery does not give us good satisfaction on steel.

Bristol, Conn.: Our men, who work by the job, say your Emery is better than any English or American Emery they ever used.

Mackintosh Hemphill Co., Pittsburgh, Pa.: The quality of your Emery Cloth is excellent.

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CAMDEN TUBE WORKS CO.,

Manufacturers of all sizes of

WROUGHT-IRON WELDED TUBE AND STEAM GAS FITTERS AND TUBE MANUFACTURER'S TOOLS, viz:

Peace's Improved Gas Pipe Screwing and Cutting-off

Machines of various sizes for both Steam and Hand Power;

No. 8, machine screws and cuts off from  $\frac{1}{2}$  to 2-inch pipe;

No. 4, machine screws and cuts off from  $\frac{1}{2}$  to 4-inch pipe;

No. 5, machine screws and cuts off from  $\frac{1}{2}$  to 6-inch pipe;

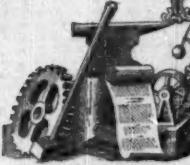
No. 6, machine screws and cuts off from  $\frac{1}{2}$  to 8-inch pipe;

No. 7, machine screws and cuts off from  $\frac{1}{2}$  to 10-inch pipe;

No. 8, machine screws and cuts off from  $\frac{1}{2}$  to 12-inch pipe;

No. 9, machine screws and cuts off from  $\frac{1}{2}$  to 14-inch pipe, price \$15; No. 10 holds from  $\frac{1}{2}$  to 16-inch pipe, price \$22. Peace's patent pipe clamp which fits on an ordinary pipe and holds from  $\frac{1}{2}$  to 2-inch pipe, price \$5. Peace's patent screwing stocks, No. 1, stock and dies, screws,  $\frac{1}{2}$  x  $\frac{1}{2}$  and  $\frac{3}{4}$  x  $\frac{1}{2}$ , price \$10; No. 2, stock and dies, screws,  $\frac{1}{2}$  x  $\frac{1}{2}$  and  $\frac{3}{4}$  x  $\frac{1}{2}$ , price \$10; No. 3, stock and dies, screws,  $\frac{1}{2}$  x  $\frac{1}{2}$  and  $\frac{3}{4}$  x  $\frac{1}{2}$ , price \$10; No. 4, stock and dies, screws,  $\frac{1}{2}$  x  $\frac{1}{2}$  and  $\frac{3}{4}$  x  $\frac{1}{2}$ , price \$10; No. 5, stock and dies, screws,  $\frac{1}{2}$  x  $\frac{1}{2}$  and  $\frac{3}{4}$  x  $\frac{1}{2}$ , price \$10; No. 6, stock and dies, screws,  $\frac{1}{2}$  x  $\frac{1}{2}$  and  $\frac{3}{4}$  x  $\frac{1}{2}$ , price \$10; No. 7, stock and dies, screws,  $\frac{1}{2}$  x  $\frac{1}{2}$  and  $\frac{3}{4}$  x  $\frac{1}{2}$ , price \$10; No. 8, stock and dies, screws,  $\frac{1}{2}$  x  $\frac{1}{2}$  and  $\frac{3}{4}$  x  $\frac{1}{2}$ , price \$10; No. 9, stock and dies, screws,  $\frac{1}{2}$  x  $\frac{1}{2}$  and  $\frac{3}{4}$  x  $\frac{1}{2}$ , price \$10; No. 10, stock and dies, screws,  $\frac{1}{2}$  x  $\frac{1}{2}$  and  $\frac{3}{4}$  x  $\frac{1}{2}$ , price \$10; No. 11, stock and dies, screws,  $\frac{1}{2}$  x  $\frac{1}{2}$  and  $\frac{3}{4}$  x  $\frac{1}{2}$ , price \$10; No. 12, stock and dies, screws,  $\frac{1}{2}$  x  $\frac{1}{2}$  and  $\frac{3}{4}$  x  $\frac{1}{2}$ , price \$10; No. 13, stock and dies, screws,  $\frac{1}{2}$  x  $\frac{1}{2}$  and  $\frac{3}{4}$  x  $\frac{1}{2}$ , price \$10; No. 14, stock and dies, screws,  $\frac{1}{2}$  x  $\frac{1}{2}$  and  $\frac{3}{4}$  x  $\frac{1}{2}$ , price \$10; No. 15, stock and dies, screws,  $\frac{1}{2}$  x  $\frac{1}{2}$  and  $\frac{3}{4}$  x  $\frac{1}{2}$ , price \$10; No. 16, stock and dies, screws,  $\frac{1}{2}$  x  $\frac{1}{2}$  and  $\frac{3}{4}$  x  $\frac{1}{2}$ , price \$10; No. 17, stock and dies, screws,  $\frac{1}{2}$  x  $\frac{1}{2}$  and  $\frac{3}{4}$  x  $\frac{1}{2}$ , price \$10; No. 18, stock and dies, screws,  $\frac{1}{2}$  x  $\frac{1}{2}$  and  $\frac{3}{4}$  x  $\frac{1}{2}$ , price \$10; No. 19, stock and dies, screws,  $\frac{1}{2}$  x  $\frac{1}{2}$  and  $\frac{3}{4}$  x  $\frac{1}{2}$ , price \$10; No. 20, stock and dies, screws,  $\frac{1}{2}$  x  $\frac{1}{2}$  and  $\frac{3}{4}$  x  $\frac{1}{2}$ , price \$10; No. 21, stock and dies, screws,  $\frac{1}{2}$  x  $\frac{1}{2}$  and  $\frac{3}{4}$  x  $\frac{1}{2}$ , price \$10; No. 22, stock and dies, screws,  $\frac{1}{2}$  x  $\frac{1}{2}$  and  $\frac{3}{4}$  x  $\frac{1}{2}$ , price \$10; No. 23, stock and dies, screws,  $\frac{1}{2}$  x  $\frac{1}{2}$  and  $\frac{3}{4}$  x  $\frac{1}{2}$ , price \$10; No. 24, stock and dies, screws,  $\frac{1}{2}$  x  $\frac{1}{2}$  and  $\frac{3}{4}$  x  $\frac{1}{2}$ , price \$10; No. 25, stock and dies, screws,  $\frac{1}{2}$  x  $\frac{1}{2}$  and  $\frac{3}{4}$  x  $\frac{1}{2}$ , price \$10; No. 26, stock and dies, screws,  $\frac{1}{2}$  x  $\frac{1}{2}$  and  $\frac{3}{4}$  x  $\frac{1}{2}$ , price \$10; No. 27, stock and dies, screws,  $\frac{1}{2}$  x  $\frac{1}{2}$  and  $\frac{3}{4}$  x  $\frac{1}{2}$ , price \$10; No. 28, stock and dies, screws,  $\frac{1}{2}$  x  $\frac{1}{2}$  and  $\frac{3}{4}$  x  $\frac{1}{2}$ , price \$10; No. 29, stock and dies, screws,  $\frac{1}{2}$  x  $\frac{1}{2}$  and  $\frac{3}{4}$  x  $\frac{1}{2}$ , price \$10; No. 30, stock and dies, screws,  $\frac{1}{2}$  x  $\frac{1}{2}$  and  $\frac{3}{4}$  x  $\frac{1}{2}$ , price \$10; No. 31, stock and dies, screws,  $\frac{1}{2}$  x  $\frac{1}{2}$  and  $\frac{3}{4}$  x  $\frac{1}{2}$ , price \$10; No. 32, stock and dies, screws,  $\frac{1}{2}$  x  $\frac{1}{2}$  and  $\frac{3}{4}$  x  $\frac{1}{2}$ , price \$10; No. 33, stock and dies, screws,  $\frac{1}{2}$  x  $\frac{1}{2}$  and  $\frac{3}{4}$  x  $\frac{1}{2}$ , price \$10; No. 34, stock and dies, screws,  $\frac{1}{2}$  x  $\frac{1}{2}$  and  $\frac{3}{4}$  x  $\frac{1}{2}$ , price \$10; No. 35, stock and dies, screws,  $\frac{1}{2}$  x  $\frac{1}{2}$  and  $\frac{3}{4}$  x  $\frac{1}{2}$ , price \$10; No. 36, stock and dies, screws,  $\frac{1}{2}$  x  $\frac{1}{2}$  and  $\frac{3}{4}$  x  $\frac{1}{2}$ , price \$10; No. 37, stock and dies, screws,  $\frac{1}{2}$  x  $\frac{1}{2}$  and  $\frac{3}{$

# PATENTS



The First Inquiry  
that presents itself to  
one who has made any  
improvement or dis-  
covery is: "Can I ob-  
tain a Patent?" A pos-  
itive answer can only be  
had by presenting a  
complete application  
to a Patent Commissioner.  
An application consists  
of a Model, Drawings,  
Petition, Oath, and full Specification.  
Various official  
races and formalities must also be observed.  
The efforts of the inventor to do all this business himself are  
generally unsuccess-  
ful. After a season of great  
pains and delay, he is usually compelled to seek the aid of  
persons experienced in patent business, and have all the  
work done over again. The best plan is to solicit proper  
advice at the beginning.

If the parties consulted are honorable men, the inventor  
may safely confide his ideas to them; they will advise  
whether the improvement is probably patentable, and  
will give him all the directions needful to protect his  
rights.

Messrs. MUNN & CO., in connection with the publication  
of the SCIENTIFIC AMERICAN, have been actively en-  
gaged in the business of obtaining patents for over twenty  
years—nearly a quarter of a century. Over Fifty thou-  
sand inventors have had benefit from our counseil. More  
than one third of all patents granted are obtained by this  
method.

Those who have made inventions and desire to consult  
with us, are cordially invited to do so. We shall be happy  
to see them in person, at our office, or to advise them by  
letter. In all cases they may expect from us an honest  
opinion. For such consultations, opinion, and advice, we  
make no charge. A pen-and-ink sketch, and a description  
of the invention should be sent, together with stamps for  
postage. Write plainly, do not use pencil nor pale  
ink; be brief.

All business committed to our care, and all consulta-  
tions, are kept by us secret and strictly confidential. Ad-  
dress MUNN & CO., 37 Park Row, New York.

**Preliminary Examination.**—In order to obtain a  
Preliminary Examination, make out a written descrip-  
tion of the invention in your own words, and a rough  
sketch of pen-and-ink sketch. Send these with the fee of  
\$5 by mail, addressed to MUNN & CO., 37 Park Row, and  
inquire if the invention is patentable. If it is, you will receive  
of, followed by a written report in regard to the patentability  
of your improvement. The Preliminary Examination  
consists of a special search, which we make with great  
care, among the models and patents at Washington to  
ascertain whether the improvement presented is patent-  
able.

In Order to Apply for a Patent, the law requires  
that a model shall be furnished, not over a foot in any di-  
mension, smaller, if possible. Send the model by express,  
pre-paid, addressed to MUNN & CO., 37 Park Row, N. Y.,  
together with a description of its operation and merits.  
On receipt thereof we will examine the invention carefully  
and give it a trial report, and then apply for a patent, on  
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County, who wishes to make money, and can give  
good references. No capital required. Will sell a busi-  
ness now paying \$100 per month, and reply on profits  
for my pay. Address 17 408]

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Pittsburgh, Pa.

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TION AND INSURANCE CO., Capital \$500,000. J. M. Al-  
len, Pres't; C. M. Pond, Vice Pres't; H. H. Haynes, Sec-  
retary. Locomotive, Stationary, and Marine Boilers, made  
of steel, iron, copper, brass, and other materials, and  
of, followed by a written report in regard to the patentability  
of your improvement. The Preliminary Examination  
consists of a special search, which we make with great  
care, among the models and patents at Washington to  
ascertain whether the improvement presented is patent-  
able.

The model should be made of any suitable mate-  
rial, strongly fastened, without glue, and neatly painted  
upon it. When the invention consists of an improve-  
ment upon some other machine, a full working model of  
the whole machine will not be necessary. But the model  
must be sufficiently perfect to show, with clearness, the  
nature and operation of the improvement.

New tools or medical compositions, and useful mix-  
tures of all kinds, are patentable.

When the invention consists of a medicine or compound,  
or a new article of manufacture, or a new composition,  
samples of the article must be furnished, neatly put up.  
Also, send us a full statement of the ingredients, prop-  
erly mode of preparation, use, and merita.

**Releases.**—A release is granted to the original pat-  
entee, his heirs, or the assignees of the entire interest,  
when by reason of an infringement or defective specifica-  
tion the party is injured, provided the error has  
arisen from inadvertence, accident, or mistake without  
any fraudulent or deceptive intention.

A patentee may, at his option, have in his release a sepa-  
rate patent for each distinct part of the invention com-  
prehended in his original application, by paying the re-  
quired fee in each case, and complying with the other re-  
quirements of the law, as in original applications.

Each division of a separate invention is the object of a  
separate specification descriptive of the part or parts of  
the invention claimed in such division; and the drawing  
may represent only such part or parts. Address MUNN  
& CO., 37 Park Row, for full particulars.

**Interferences.**—When each of two or more persons  
claims to be the first inventor of the same thing, an "In-  
terference" is declared between them, and a trial is had  
before the Commissioner. Not does the fact that one of  
the parties has already obtained a patent prevent such an  
interference; but, although the party in question, without  
giving notice, has obtained a patent, he may, if he finds  
that another person was the prior inventor, give him also  
a patent, and thus place them on an equal footing before  
the courts and the public.

**Caveats.**—A Caveat gives a limited but immediate  
protection, and is particularly useful where the invention  
is not fully completed, or the model is not ready, or fur-  
ther time is wanted for experiment or study. After a Ca-  
veat has been filed, the Patent Office will not issue a pat-  
ent to the same invention to any other person, without a  
prior notice of the Caveat having been given. If no notice  
is given, a patent is already issued, he may, if he finds  
that another person was the prior inventor, give him also  
a patent, and thus place them on an equal footing before  
the courts and the public.

**Applications.**—When, from any reason,  
parties are desirous of applying for Patents or Caveats, in  
GREAT BRITAIN, without a moment's loss of time, they have  
only to write or telegraph us specially to that effect,  
and we will make special exertions for them. We can  
prepare and mail the necessary papers at less than an  
hour's notice, if required.

**Foreign Patents.**—American Inventors should be  
in mind that, as a general rule, any invention that is val-  
uable to the United States in the world, is equally valuable  
in as much of Europe and some other foreign countries.  
Five Agents—American, English, French, Belgian, and  
Prussian—will secure an Inventor exclusive monopoly to  
his discovery among ONE HUNDRED AND THIRTY MILLIONS  
of the most intelligent people in the world. The facili-  
ties of business and steam communication are such that  
patents can be obtained abroad by our citizens almost as  
readily as at home. The majority of patents taken out  
by Americans in foreign countries are obtained through  
the SCIENTIFIC AMERICAN PATENT AGENTS. A Circular  
containing further information and a Synopsis of the Pat-  
ent Laws of various countries will be furnished on applica-  
tion to Messrs. MUNN & CO.

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Interferences, Hints on Selling Patents, Rules and Pro-  
cedures, etc., see our Instruction Book. Some free by mail on application.  
Those who receive more than one copy thereof will oblige  
by presenting them to their friends.

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